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Additions to the Fauna of t

Firth of Forth pt. 6.

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(II.)—ADDITIONS TO THE FAUNA OF THE FIRTH OF FORTH.

PART VI. By THOMAS SCOTT, F.L.S. (Plates V.–X.)

In my paper—'Additions to the Fauna of the Firth of Forth,' Part V. published in the *Eleventh Annual Report of the Fishery Board for Scotland* (1893), it is stated that some of the species that are there described for the first time had been known for some years previously, but had been allowed to stand over for want of sufficient information concerning them; the same statement may be made now, as not a few of the species recorded in the sequel have been in my possession since 1889, 1890, and 1891. There is nothing unusual in this, because an accurate knowledge of such small organisms, as many of the *Copepoda* are, and even of larger forms, can only be acquired by careful study extending over a lengthened period. Though much has now been done to throw light on the distribution of the Crustacean fauna of the Firth of Forth, my experience leads me to believe that much still remains to be done ere our knowledge of this group—a group that forms an important part of fish-food—attains to anything approaching completeness. In the present paper, the additions to the Forth fauna include 43 species of *Copepoda*, 1 species of *Ostracoda*, 10 species of *Amphipoda*, 1 species of *Annelida*, and 1 species of *Mollusca*,—in other words, 56 species of invertebrates, of which, so far as I know, no previous records of their occurrence in the Forth have been published, now fall to be added to those recorded in preceding papers. I again find it necessary to leave over several species of *Copepoda* for further study; the *Amphipoda* also require further investigation; and, thanks to the excellent work of Professor G. O. Sars of Norway, the study of this difficult group will, ere long, become comparatively easy. Very much, also, still remains to be done among the *Annelida* of the Forth. One interesting group—the *Nemertians*—has scarcely yet been touched; but the sea is a boundless storehouse whose treasures will never be exhausted.

Seventeen species of the *Copepoda* now recorded are described and figured here for the first time; preliminary descriptions of other 7 species new to science, and 1 new to Britain, have been published in the *Annals and Magazine of Natural History* for October 1893, and February 1894, and 1 species, new to Britain, is recorded here. A few of the others are new to the East Coast.* In my paper 'Additions to the Forth Fauna,' Part III. (*Ninth Annual Report of the Fishery Board for Scotland*, 1891), the following statement occurs:—'I venture to predict that when 'the Firth of Forth becomes more thoroughly and systematically worked 'up, the number of Crustacea will be little, if at all, short of 500 species.' In connection with this statement it may be of interest to mention that the number of species of Forth Crustacea, including those recorded in the present paper, now amounts to over 480.

My son, Mr Andrew Scott, has prepared all the drawings, and a large part of the necessary dissections required in the preparation of this paper. I may also say that, as in former years, the great interest taken in all our work, by Dr Fulton, has been a source of much encouragement. By his assistance, ever willingly given, I have been enabled to have the

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* Several rare and new species have also recently been added to the British fauna from the Moray Firth District (see the parts of the *Annals and Magazine of Natural History* already referred to).

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privilege of consulting literature that would otherwise have been difficult to get hold of. I have also to acknowledge my indebtedness to Mr Webster of the University Library for valuable assistance in this respect.

Before proceeding to describe the animals that have been added to the Forth fauna during the past year, it will perhaps be useful and interesting if in some measure, at least, I try to show what progress has now been made towards the attainment of a better knowledge of the Invertebrate fauna of the Firth of Forth through the investigations that have been carried on in the estuary under the direction of the Fishery Board for Scotland, and also the amount of success that has attended these investigations. For the present I can only indicate what has been accomplished in the study of the *Copepoda*, leaving the other groups to be dealt with later on. In this attempt to summarise the results of the work that has been done during the last few years among this important group of the Crustacea, I propose, in the first place, to give a list of all those species obtained in the Firth of Forth that have already been described and figured in the 'Monograph of the British Copepoda,' published in 1880; this will form a basis for, and an incitement to, further work by showing what blanks have yet to be filled up ere this part of the list can be considered complete. Second, I propose to give a list of those species obtained in the Firth of Forth which are not included in that Monograph, but have been added to the British fauna by other investigators since the publication of that work. A third list will include those species that have been added to the British fauna as the direct result of the Scottish Fishery Board's Investigations. And a fourth list will contain those species, apparently new to science, discovered during the progress of the investigations referred to.

The species are arranged in alphabetical order, and those described in this report are included with the others in the various lists.

List No. I.

The Copepods contained in this list include only those species that are described in the 'Monograph of British Copepoda,' by Dr Brady, published in 1878–80. (Fresh-water species are not included in the list.)

Acartia longiremis (Lillj.).
Acontiophorus scutatus (B. and R.).
Alteutha depressa, Baird.
,, *interrupta* (Goodsir).
Ameira longipes, Boeck.
Amymone sphærica, Claus.
Anomalocera patersonii, Templeton.
Artotrogus boeckii, G. S. Brady.
,, *magniceps*, G. S. Brady.
Ascidicola rosea, Thorell.
Calanus finmarchicus (Gunner).
Candace pectinata, G. S. Brady.
Canthocamptus palustris, Brady.
Centropages hamatus (Lillj.).
,, *typicus*, Kroyer.
Cletodes limicola, Brady.
,, ,, var. *gracilis*, Brady.
,, *longicaudata*, B. and R.
,, *propinqua*, B. and R.
Cyclopicera gracilicauda, G. S. B.
,, *nigripes*, B. and R.
,, *lata*, G. S. B.
Cyclopina gracilis, Claus.
,, *littoralis* (Brady).
Cyclops æquoreus, Fischer.
Cylindropsyllus lævis, Brady.
Dactylopus brevicornis, Claus.
,, *flavus*, Claus.
,, *minutus*, Claus.
,, *stromii* (Baird).
,, *tisboides*, Claus.
,, *tenuiremus*, B. and R.
Delavalia palustris, Brady.
,, *reflexa*, B. and R.
Doropygres normani, Brady.
,, (?) *porcicauda*, Brady.
Ectinosoma atlanticum (B. and R.).
,, *erythrops*, Brady.
,, *melaniceps*, Boeck.
,, *spinipes*, Brady.
Enhydrosoma curvatum (B. and R.).
Enterocola eruca, Norman.
Eurytemora clausii (Hoek).
Harpacticus chelifer (Müller).
,, *flexus*, B. and R.
,, *fulvus*, Fischer.
Idya furcata (Baird).
Jonesiella spinulosa.
Laophonte curticauda, Boeck.
,, *hispida* (B. and R.).
,, *horrida* (Norman).
,, *lamellifera* (Claus).

Laophonte longicaudata, Boeck.
,, _serrata_ (Claus).
,, _similis_ (Claus).
,, _thoracica_, Boeck.
Lichomolgus arenicolus, Brady.
,, _fucicolus_, Brady.
,, _furcillatus_, Brady.
Longipedia coronata, Claus.
Mesochra lilljeborgia, Boeck.
Metridia armata, Boeck.
Misophria pallida, Boeck.
Nannopus palustris, Brady.
Normanella dubia (B. and R.).
Notodelphys allmanni, Thorell.
,, _ceruloea_, Thorell.
Oithona spinifrons, Boeck.
Parapontella brevicornis (Lubbock).
Platychelipus littoralis, G. S. Brady.
Porcellidium fimbriatum, Claus.
Pseudanthessius liber (B. and R.)
,, _thorellii_ (B. and R.)
Pseudocalanus elongatus (Boeck).
Pseudocyclops crassicornis, Brady.
,, _obtusatus_, B. and R.
Pterinopsyllus insignis, Brady.
Robertsonia tenuis (B. and R.).
Scutellidium fasciatum (Boeck).
Stenhelia hispida, Brady.
,, _ima_, Brady.
Tachidius brevicornis (Müller).
Temora longicornis (Müller).
Tetragoniceps malleolata, G. S. Brady.
Thalestris clausii, Norman.
,, _harpactoides_, Claus.
,, _helgolandica_, Claus.
,, _longimana_, Claus.
,, _rufocincta_, Norman.
,, _rufoviolascens_, Claus.
,, _serrulata_, G. S. Brady.
Thorellia brunnea, Boeck.
Westwoodia nobilis, Baird.
Zaus goodsiri, G. S. Brady.
,, _spinatus_, Goodsir.
Zosime typica, Boeck.

LIST NO. II.

This list includes those Copepods discovered in the Firth of Forth that have been added to the British fauna either as new species or new additions by investigators other than those in the service of the Fishery Boards for Scotland, since the publication of 'The Monograph of British 'Copepoda.'

Acartia bifilosus, Giesbrecht.
,, _clausi_, Giesbrecht.
,, _discaudata_, Giesbrecht.
Eurytemora affinis, Poppe.
Jonesiella hyœnœ, I. C. Thompson.
Monstrilla rigida (I. C. Thompson).
Paracalanus parvus (Claus).
Stenhelia denticulata, I. C. Thompson.
,, _hirsuta_, I. C. Thompson.
Tachidius littoralis, Poppe.

LIST NO. III.

This is a list of several described species of Copepods from the Firth of Forth that have been added to the British fauna as one of the immediate results of the investigations carried out under the direction of the Fishery Board for Scotland.

Bomolochus soleœ, Claus.
Herrmannella rostrata, Canu.
Lichomolgus agilis, Leydig.
Modiolicola insignis, Aurivillius.
Monstrilla helgolandica, Claus.
Oithona setiger, Dana.
Pseudanthessius gracilis, Claus.
,, _sauvagei_, Canu.

LIST NO. IV.

This list contains all those species (including those in the present Report), apparently new to science, that have been discovered in the Firth of Forth during the progress of the investigations referred to.

Acontiophorus elongatus, T. and A. Scott.
*_Ameira exigua_, T. Scott.
,, _exilis_, T. and A. Scott.
,, _longicaudata_, T. Scott.
* ,, _longiremis_, T. Scott.
* ,, ,, var. _intermedia_.
* ,, _reflexa_, T. Scott.
Artotrogus papillatus, T. Scott.
Canuella perplexa, T. and A. Scott.
*_Cletodes curvirostris_, T. Scott.
,, _irrasa_, T. and A. Scott.
,, _lata_, T. Scott.
,, _tenuiremis_, T. Scott.
*_Cyclopina elegans_, T. Scott.
Cyclopicera pupurocincta, T. Scott.
Cyclops ewarti, Brady.
Cylindropsyllus minor, T. Scott.
*_Dactylopus coronatus_, T. Scott.
,, _rostratus_, T. Scott.

* New species described for the first time in this Report.

Delavalia œmula, T. Scott.
Dermatomyzon gibberum, T. and A. Scott.
Hersiliodes littoralis (T. Scott).
***Heteropsyllus curticaudatus*, T. Scott.
**Laophonte denticornis*, T. Scott.
* ,, *depressa*, T. Scott.
,, *inopinata*, T. Scott.
,, *littorale*, T. and A. Scott.
* ,, *simulans*, T. Scott.
***Laophontodes typicus*, T. Scott.
***Leptopsyllus typicus*, T. Scott.
Lichomolgus hirsutipes, T. Scott.
Longipedia minor, T. and A. Scott.
Neobradya pectinifer, T. Scott.
Paramesochra dubia, T. Scott.
Parartotrogus richardi, T. and A. Scott.
***Pontopolites typicus*, T. Scott.
**Pseudocyclopia caudata*, T. Scott.
,, *crassicornis*, T. Scott.
,, *minor*, T. Scott.
***Pseudowestwoodia andrewi*, T. Scott.
Stenhelia dispar, T. and A. Scott.
Stephos minor, T. Scott.
Tetragoniceps bradyi, T. Scott.
* ,, *consimilis*, T. Scott.
,, *incertus*, T. Scott.
,, *macronyx*, T. Scott.
Thalestris forficuloides, T. and A. Scott.

In the 'Monograph of British Copepoda' 131 species are described and figured exclusive of the fresh-water forms. In list No. I., given above, 95 of these are recorded for the Firth of Forth, or nearly 72 per cent. of the total number of species, exclusive of the fresh-water forms recorded for the British Islands in 1880. It will be observed from these statements that 36 of the marine species described in the 'Monograph of British Copepoda' have not, so far, been recorded for the Forth area. On the other hand, a considerable number of species have been discovered in the Firth of Forth, in addition to those described in the Monograph referred to, and the majority of these have been recorded for the first time for the British Islands, either as species that have been described by European and other writers, or as species new to science, as shown by the following summary of the four preceding Lists :—

In List No. I. 95 species are recorded for the Forth, . .	95
In List No. II. 10 species are recorded, . . .	10
In List No. III. 8 species (new to Britain) are recorded, .	8
In List No. IV. 46 species (new to Science) are recorded, .	46
Total number of species of Copepoda recorded for the Forth, including those described in the present Report, . . .	159
†Total number for the British Islands in 1880, ...	131
Excess of Forth species over those for the British Islands in 1880, ...	28

A few of the species included in this enumeration of the Copepoda of the Firth of Forth are probably somewhat doubtful, and may ultimately be set aside, as, for example, *Acartia bifilosus*, Giesbrecht, and *Oithona setiger*, Dana ; but making all due allowance for such doubtful species, it will, I think, be acknowleged that, even in the department of Marine Natural History, a fairly successful endeavour has been made to take full advantage of the great and almost unique opportunities enjoyed for the prosecution of such studies.

I will now proceed to describe the various species of Invertebrates that have been discovered in the Firth of Forth since the publication of the Eleventh Annual Report of the Fishery Board for Scotland ; and the Copepoda will be taken first in order.

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* New species described for the first time in this Report.

** New genus and species described for the first time in this Report.

† This number is taken from the Index at the end of vol. iii. of the 'Monograph 'of British Copepoda.'

DESCRIPTION OF SPECIES.

CRUSTACEA.

1. COPEPODA.

Family CALANIDÆ.

Genus *Paracalanus*, Boeck (1864).

Paracalanus parvus (Claus).

1863. *Calanus parvus*, Claus (13),* p. 173, pl. xxvi. figs. 10–14; pl. xxvii. figs. 1–4.
1864. *Paracalanus parvus*, Boeck (5), p. 232.
1892. *Paracalanus parvus*, Canu (11), p. 169.
1893. *Paracalanus parvus*, I. C. Thompson (33), p. 7, pl. xv. fig. 5.
1894. *Paracalanus parvus*, T. Scott (30), p. 26, pl. i. figs. 1–19.

Habitat.—East of May Island, in a surface tow-net gathering. Frequent. Off St Monans. Not common.

Paracalanus parvus is easily distinguished from any other species of the British Calanidæ by the structure of the fifth pair of thoracic feet in both sexes. The only other British record for this species seems to be that of I. C. Thompson in the 'Copepoda of Liverpool Bay.' The distribution of the species appears to be world-wide; it has been recorded from the North Sea, from the Atlantic (North and South), from the Mediterranean, and from the China Sea.

Genus *Acartia*, Dana, 1846.

Acartia clausi, Giesbrecht.

1889. *Acartia clausi*, Giesbrecht (17), p. 332.
1890. *Acartia clausi*, Canu, (10*a*), p. 326, pl. xxiv.
1893. *Acartia clausi*, I. C. Thompson (33), p. 8, pl. xv. fig. 6.
1894. *Acartia clausi*, T. Scott (30), p. 67, pl. vii. figs. 33–40.

Habitat.—Several parts of the Forth area. One of the chief characters that distinguish this species is the form of the fifth pair of thoracic feet. The fifth pair in the female are each armed with a stout and comparatively short apical spine in addition to the plumose seta. The following forms of Acartia are also obtained in the Firth of Forth, viz. :—*Acartia longiremis* (Lillj.), generally distributed, especially in the estuary proper. *Acartia discaudata*, Giesbrecht, off Musselburgh. *Acartia bifilosus*, Giesbrecht, West of Queensferry.

Family PSEUDOCYCLOPIIDÆ, nov. family.

Body comparatively robust. Anterior antennæ short, sixteen to seventeen-jointed. Alike on both sides in the male, and similar to those of the female. Mouth organs and swimming-feet like those of the *Calanidæ*. Fifth pair in the female simple, one-branched, and two-jointed;

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* The numbers in parentheses correspond with the numbers in the Bibliographical list at the end of the paper.

in the male dissimilar, and forming powerful grasping organs. The mandible-palp is comparatively small. One of the most prominent characters of this family is the structure of the anterior antennæ. The most careful observation failed to show any difference between the male right antenna and the left, and both were similar to those of the female. In my paper on the Forth Fauna, published in Part III. of the *Eleventh Annual Report of the Fishery Board for Scotland*, two species of Copepoda were described, for which it was considered necessary to institute a new genus (*Pseudocyclopia*). This new genus was placed in the family *Misophriidæ*, Brady, because of its closer affinity with that family than with the family *Calanidæ*. A further study of the characters of the genus has, however, led me to the conclusion that its position in the family *Misophriidæ* is untenable; and as there is no other family in which it can satisfactorily be included, I propose to constitute the family *Pseudocyclopiidæ* for its reception; and I do so with the greater confidence, as another species, now to be described, has recently been discovered, possessing all the more prominent characters that distinguish the two already described. Dr W. Giesbrecht, in his memoir 'Mitt'heilungen über Copepoden' (Abdruck aus den Mittheilungen aus der Zoologischen Station zu Neapel, ii. Band 1.2. Heft), also refers to some of the peculiar characters of the two described species, and to the difference between them and those that constitute the family *Misophriidæ*.

Genus *Pseudocyclopia*, T. Scott (1892).

Pseudocyclopia caudata, sp. n. (Pl. V. figs. 1–8.)

Female. Like *Pseudocyclopia crassicornis*, T. Scott, in general appearance and dimension. Length, ·65 mm. ($\frac{1}{38}$th of an inch). Anterior antennæ seventeen-jointed. Basal joint very large, the others small; the second to the fifth gradually decrease in size, the sixth is rather longer than that which preceeds or follows, while the ante-penultimate joint is more elongate than any of the others except the basal joint. The formula shows approximately the proportional lengths of all the joints :—

$$\frac{29 \cdot 8 \cdot 7 \cdot 5 \cdot 4 \cdot 7 \cdot 5 \cdot 8 \cdot 6 \cdot 9 \cdot 7 \cdot 7 \cdot 8 \cdot 10 \cdot 16 \cdot 9 \cdot 12 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12 \cdot 13 \cdot 14 \cdot 15 \cdot 16 \cdot 17 \cdot}$$

The posterior antennæ, mouth organs, and first and second swimming-feet are somewhat similar to those of *Pseudocyclopia crassicornis.* The basal spines of the third pair of swimming-feet, which reach to near the extremity of the outer branches, are very stout, and with the distal end boldly curved—the basal spines, very like those of *Pseudocyclopia minor*, T. Scott. The fifth pair are somewhat more robust than those of the females of the two described species, and are each armed with three stout sub-equal and setose terminal spines. The caudal stylets are nearly equal to the combined length of the last two abdominal segments, as shown in the accompanying figures.

Habitat.—Off St Monans. Scarce.

Remarks.—*Pseudocyclopia caudata* is similar in its general appearance to the two species already described; but is readily distinguished from both, even without dissection, by the comparatively elongate caudal stylets. The difference in the proportional lengths of the joints of the anterior antennæ, and in the structure of the third and fifth pairs of thoracic feet between this and the other two species, is also of sufficient importance for diagnostic purposes.

Family Misophriidæ, Brady (1878).

Genus *Misophria*, Boeck (1864).

Misophria pallida, Boeck.
1864. *Misophria pallida*, Boeck (5), p. 24.
1878 *Misophria pallida*, Brady (8), vol. i. p. 79, pl. xiii. figs. 11–16; pl. xviii. figs. 11–12.

Habitat.—Off St Monans, and also west of Queensferry.

Several specimens of this apparently rare species have been obtained at both the parts of the Forth area mentioned.

Genus *Pseudocyclops*, Brady (1872).

Pseudocyclops crassiremis, Brady.
1872. *Pseudocyclops crassiremis*, Brady (7*a*), vol. iv. p. 431, pl. xvii. figs. 1–8.
1878. *Pseudocyclops crassiremis*, Brady (8), vol. i. p. 82, pl. vii. figs. 1, 2; pl. xii. fig. 14.

Habitat.—Off St Monans. Rather scarce.

This seems to be a perfectly distinct species, so far as could be made out.

Family Cyclopidæ.

Genus *Cyclopina*, Claus (1863).

Cyclopina gracilis, Claus.
1863. *Cyclopina gracilis*, Claus (14), p. 104, pl. x. figs. 9–15.
1878. *Cyclopina gracilis*, Brady (8), vol. i. p. 93, pl. xxiv.b. figs. 1–9; pl. xci. figs. 10, 11.
1892. *Cyclopina gracilis*, Canu (11), p. 181.

Habitat.—Off St Monans, and various other parts of the Forth west to near Charleston.

This pretty and well characterised species is not uncommon within the Forth area.

Cyclopina elegans, sp. n. (Pl. V. figs. 9–19.)

Description.—Female. Length, ·83 mm. ($\frac{1}{30}$th of an inch). Body elongate, slender. Forehead narrowly and evenly rounded. Anterior antennæ rather shorter than the first cephalo-thoracic segment, and consisting of nineteen joints. The fifth to the ninth joints are very short, while the eleventh is about equal in length to the basal joint, and considerably longer than any of the others that preceed or follow, as is shown by the formula:—

$$\frac{12\cdot6\cdot5\cdot5\cdot3\cdot2\cdot2\cdot2\cdot3\cdot11\cdot4\cdot4\cdot4\cdot4\cdot4\cdot5\cdot4\cdot6\cdot7\cdot}{1\cdot2\,.\,3\cdot4\cdot5\cdot6\cdot7\cdot8\cdot9\cdot10\cdot11\cdot12\cdot13\cdot14\cdot15\cdot16\cdot17\cdot18\cdot19\cdot}$$

The fourth joint appears to be composed of two coalesced joints, as a faint line could be observed extending from the upper margin to fully halfway across the joint (fig. 10). Posterior antennæ four-jointed, secondary branch obsolete or entirely absent (fig. 12). Mandibles well developed, and furnished with a large palp. The primary branch of the palp is elongate and three-jointed; while the secondary branch, which springs from the basal part of the primary branch, is short and four-jointed (fig. 13). The basal part of the maxilla-palp, which is delated outwards, bears two distinct one-jointed branches on the exterior margin (fig. 14). Anterior foot-jaws four-jointed, with the basal joint very large comparatively, and the end joints small; the second joint is produced interiorly so as to form a base for a stout curved spine (fig. 15). Posterior foot-jaws elongate, seven-jointed, the last five joints small, their entire length being very little greater than the length of the second joint (fig. 16). Swimming-feet robust, both branches three-jointed. The marginal spines of the outer branches of the first pair are large and dagger-shaped, and project at, or nearly at, a right angle to the outer margin. Those of the fourth pair are much smaller, but the marginal setæ on both the outer and inner branches, but especially on the inner branches, are stouter than the marginal setæ of the first pair. In the first pair, also, a stout spine springs from the inner distal margin of the second basal joint, and projects downwards beyond the end of the second joint of the inner branches (fig. 17). Fifth pair stout, each consisting of a single three-jointed branch. The breadth of the first two joints is greater than the length; while the third joint is longer than broad, being equal to the entire length of the first two. The first joint bears a moderately long plumose seta on the outer distal angle. The second joint bears a similar seta on the inner distal angle, while the last joint bears two plumose setæ on the inner margin, and one plumose seta and a dagger-shaped spine at the apex (fig. 19). Caudal stylets elongate, being equal to the combined length of the last two segments of the abdomen; and, in addition to the terminal setæ, each of the stylets bears one small hair near the proximal end, and another near the distal end of the outer margin. In the male the anterior antennæ are sixteen-jointed, the last six being more or less modified for grasping; the eleventh joint is comparatively robust and hinged to the preceding one. There is also a hinged articulation between the penultimate and ante-penultimate joints (fig. 11).

Habitat.—Off St Monans. Rather rare.

Remarks.—The species now described differs in some important points from any other *Cyclopina* recorded from the British seas. It resembles *Cyclopina littoralis* in the form of the fifth pair of thoracic feet, but the proportional lengths of the joints of the anterior and posterior antennæ, and the structure of the first pair of swimming-feet, are decidedly different. It also, in this respect, differs from *Cyclopina ovalis*, Brady; while the shorter and much fewer jointed anterior antennæ of *Cyclopina gracilis*, Claus, readily distinguish that species from the one now described.

Genus *Pterinopsyllus*, Brady (1880).

Pterinopsyllus insignis, Brady.

1878. *Lophophorus insignis*, Brady (8), vol. i. p. 122, pl. xiii. figs. 1–10; pl. xv. fig. 10.
1880. *Pterinopsyllus insignis*, Brady (8), vol. iii. p. 23. (*Lophophorus* being preoccupied, Dr Brady substituted the word *Pterinopsyllus* for this genus).
1893. *Pterinopsyllus insignis*, T. and A. Scott (32), p. 243.

Habitat.—West of Queensferry. Frequent. This beautiful species has several times been obtained in the part of the Forth estuary referred to. In this part of the Forth there are periodic and very marked variations in the salinity of the water; caused on the one hand by the ebb and flow of the tide, and on the other by the large volumn of fresh water from the river, which, forced back by the flowing tide, accumulates in the upper reaches, and, when the reflux takes place, rushes seawards with overpowering force, so that, during the later part of the ebb, and the early part of the flood tide, there is a large admixture of fresh water in this portion of estuary of the Forth. It may be that the peculiar alternating conditions thus produced are favourable to the welfare of this and other organisms; but whether that be so or not, it is certain that *Pterinopsyllus* is comparatively frequent here, while it is apparently exceedingly rare where the more normal marine conditions prevail.*

Family HARPACTICIDÆ, Claus (in Part).

Genus STENHELIA, Boeck (1864).

Stenhelia hispida, Brady.

1880. *Stenhelia hispida*, Brady (8), vol ii. p. 32, pl. xlii. figs. 1–14.
1893. *Stenhelia hispida*, I. C. Thompson (33), p. 19.

Habitat.—Of St Monans. Rather scarce.

This, which appears to be a comparatively rare species in the British seas, is apparently widely distributed. It has been obtained at Tobermory (Rev. A. M. Norman); off Hartlepool and Marsden, Durham, and at Portincross, Ayrshire (Dr G. S. Brady); in Ventry Bay, Ireland (Mr E. C. Davidson); in rock-pools at Hilbre and Puffin Islands, at Garth Ferry, and in Port Erin Bay, Isle of Man (I. C. Thompson).

Stenhelia hirsuta, I. C. Thompson.

1893. *Stenhelia hirsuta*, I. C. Thompson (33), p. 20, pl. xxxi.
1894. *Stenhelia hirsuta*, T. and A. Scott (31), p. 146.

Habitat.—Off St Monans and at the north end of Inchkeith Island.

Mr I. C. Thompson, of Liverpool, obtained this interesting species amongst mud dredged from 29 fathoms in the Irish Sea, and about twelve miles west from Port Erin, Isle of Man. The females of this species carry two ovisacs as shown by Thompson's figure; and several of the specimens obtained in the Firth of Forth were also provided with two ovisacs.

Stenhelia dispar, T. and A. Scott.

1894. *Stenhelia dispar*, T. and A. Scott (31), p. 141, pl. viii. figs. 8–12.

Description.—Female. Length, ·55 mm. ($\frac{1}{45}$th of an inch). Rostrum of moderate length. Anterior antennæ short, moderately stout, and eight-jointed. the fifth, sixth, and seventh joints are small, but the last is about equal to the combined length of the two preceding joints, as shown by the annexed formula:—

$$\frac{27 \cdot 19 \cdot 13 \cdot 14 \cdot 6 \cdot 9 \cdot 8 \cdot 18\cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8\cdot}$$

The posterior antennæ are somewhat similar to those of *Stenhelia ima*, Brady, except that the last joint of the secondary branch bears one marginal and one apical seta instead of two apical setæ. Mouth organs similar to those of *Stenhelia ima.* First pair of thoracic feet slender, and also somewhat like those of that species. A spiniform plumose seta springs from the lower margin of the second basal joint, and close to the proximal end, interiorly, of the inner branches; there are no setæ on the inner margin of the outer branches. The fourth pair are also somewhat similar to those of *Stenhelia ima.* The basal joint of the fifth pair is large and sub-triangular, and furnished with three setæ on the inner margin and two at the apex. The secondary branch is comparatively small and broadly sub-ovate, with a somewhat bifid apex, and bears one seta on the inner margin, one on the outer margin, and one on each lobe of the bifid apex. Caudal stylets very short.

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* My son obtained *Pterinopsyllus* in material from the Moray Firth dredged from a depth of 40 fathoms.

Habitat.—Vicinity of the Bass Rock. Rather scarce.

Remarks.—This is a small species, and resembles *Stenhelia ima* in several of its characters ; but the short anterior antennæ, and the large basal joint, and comparatively small and broadly ovate secondary joint of the fifth pair of thoracic feet, readily distinguish it from that species.

Stenhelia denticulata, I. C. Thompson.

1893. *Stenhelia denticulata*, I. C. Thompson (33), p. 20, pl. xxx. figs. 1–11.

1894. *Stenhelia denticulata*, T. and A. Scott (31), p. 146.

Habitat.—Off St Monans, and in the vicinity of Inchkeith Island.

Mr I. C. Thompson obtained the two specimens, from which he described the species inside the breakwater, at Port Erin, Isle of Man. Several specimens have been captured in the Firth of Forth. This is a comparatively large and well-marked species. The anterior antennæ are moderately long and slender, and eight-jointed. The second joint from the base is armed with a strong forward-projecting tooth.

Genus *Ameira*, Boeck (1864).

Ameira reflexa, sp. n. (Pl. V. figs. 20–28.)

Description.—Female. Body moderately robust. Length, ·68 mm. ($\frac{1}{40}$th of an inch). Anterior antennæ short, stout, and eight-jointed. The first two joints are large, the others are small, the penultimate being shorter than any of the others. The upper distal portion of the fourth joint is produced forwards so as to form the base of a long filiment. The proportional lengths of all the joints are nearly as in the formula :—

$$\frac{16 \cdot 14 \cdot 6 \cdot 5 \cdot 4 \cdot 5 \cdot 3 \cdot 6 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot}$$

Posterior antennæ short, two-jointed. A small secondary branch springs from near the middle of the first joint, and is furnished with three terminal setæ (fig. 22). Mandibles small. Mandible-palp one-branched. The basal joint is small, and bears a single short terminal seta. The small one-jointed branch springs from the upper part of the external margin of the basal joint, and bears one marginal and three apical setæ (fig. 23). Posterior foot-jaws short, moderately stout, consisting of two subequal joints, the lower rounded margin of the second joint ciliated. Terminal claw nearly straight, and rather longer than the joint from which it springs (fig. 24). Both branches of the first four pairs of swimming-feet three-jointed ; the outer branches of the first pair reach slightly beyond the end of the second joint of the inner branches. The first joint of the inner branches is stout, and somewhat longer than the second joint, and bears a moderately long plumose seta near the middle of the inner margin. The second joint—which is rather smaller than the first—is furnished with a similar seta near the distal end ; while the last joint, which is slender, and fully one and a half times the length of the second, is provided with one moderately short and two long setæ at the apex, and three small spiniform setæ on the inner margin. The first and second joints in both branches are strongly ciliated on the outer margin. The first two joints of the outer branches are each armed with a moderately long marginal spine, and the last joint with two shorter marginal spines, and three plain terminal setæ (fig. 25). The outer branches of the next three pairs are somewhat longer than the inner branches, and both branches are elongate, and moderately stout. In the fourth pair the first two joints of the outer branches are sub-equal, but the last is nearly equal to twice the length of the preceding one ; the joints of the inner branches are each somewhat longer than the one preceding, so that the last is fully twice the length of the first. Both branches have the outer margin more or less ciliated, the marginal and terminal setæ are nearly all elongate and strongly plumose, and the marginal spines of the outer branches are slender (fig. 26). The basal joint of the fifth pair is broadly foliacous, the apical portion of which is sub-triangular and furnished with six setæ round the inner margin and end, the third one from the outside being very long. The secondary branch is comparatively small, oblong-ovate in form, and extends somewhat beyond the end of the basal joint. There are several setæ round the outer margin and apex (fig. 27). Caudal stylets short, being rather more than half the length of the last adominal segment. The principal terminal seta of each stylet is nearly twice the length of the second (fig. 28).

Habitat.—Off Musselburgh, Firth of Forth. Rather scarce.

Remarks.—In the structure of the anterior antennæ, and of the first and fifth pairs of thoracic feet, this species differs from any others known to me. Neither the anterior antennæ nor the first swimming-feet are those of the typical *Ameira*. The end joint of the inner branches of the first pair is, in *Ameira*, usually shorter than the basal joint, but in the species now described the reverse is the case ; but otherwise there is nothing to distinguish it generically from *Ameira*.

Ameira longiremis, sp. n. (Pl. V. figs. 29–32 ; Pl. VI. figs. 1–5.)

Description. — Female. Body elongate, robust. Length, ·74 mm. ($\frac{1}{34}$th of an inch). Anterior antennæ short, stout, eight-jointed. The first to the fifth joints gradually decrease in length, the fifth and sixth are about equal, while the sixth to the eighth gradually increase in length ; the fourth bears a long and moderately stout sensory filament. The annexed formula shows the proportional lengths of all the joints :—

$$\frac{16 \cdot 14 \cdot 11 \cdot 7 \cdot 6 \cdot 6 \cdot 8 \cdot 10 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot}$$

Posterior antennæ comparatively large, two-jointed. Secondary branch small, one-jointed, and attached to the middle of the basal joint of the primary branch. The mandible-palp consists of a comparatively large basal joint, with a much smaller secondary one at its apex. The secondary joint bears one marginal and a few apical setæ. Posterior foot-jaws stout, the second joint somewhat gibbous below, and armed with a comparatively long terminal claw (fig. 30, pl. V.). The first pair of swimming-feet somewhat similar to those of *Ameira reflexa*, but much stouter and more elongate. In the fourth pair the inner branches are proportionally much shorter than in that species, as they scarcely reach to the end of the second joint of the outer branches. The first joint is very short, while the second and third are each rather longer than the preceding one. The armature of the fourth pair is different from that of the fourth pair in *Ameira reflexa* (fig. 5, pl. VI.). In the fifth pair the basal joint is broadly triangular, and bears two stout spiniform setæ on the distal half of the inner margin, and two apical setæ ; one of them small, the other very long, plumose, and spiniform. The secondary branch is elongate, narrow, cylindrical, being nearly five times longer than broad. Both margins are more or less ciliate. The apex is obliquely truncate, and bears several setæ (fig. 31, pl. V.). Caudal stylets very short.

Habitat.—Off St Monance. Scarce.

Remarks.—This is a robust species, with comparatively elongate swimming-feet. It is readily distinguished by the peculiar form of the fifth pair of thoracic feet.

Ameira longiremis, var. *intermedia*, nov. var. (Pl. VI. figs. 6–14.)

This form differs from the species just described, and of which it appears to be a variety, and the more important of these differences are as follows:—The anterior antennæ are shorter and less robust, and the proportional lengths of the joints are not the same, as shown by the formula:—

$$\frac{10 \cdot 14 \cdot 8 \cdot 6 \cdot 5 \cdot 6 \cdot 6 \cdot 6 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot}$$

The last joint of the inner branches of the first thoracic feet is considerably shorter, and the spine that springs from the inner distal angle of the second basal joint is much longer than in the first pair of *Ameira longiremis*. The basal joint of the fifth pair is narrower at the proximal end, and more produced; and the secondary branch is rather broader, and less cylindrical in form. These various differences, though scarcely marked enough to be of specific value, are yet sufficiently important to constitute a varietal difference.

Ameira exilis, T. and A. Scott. (Pl. IX. fig. 30; Pl. X. figs. 1–12.)
1894. *Ameira exilis*, T. and A. Scott, p. 139, pl. viii. figs. 18–20; pl. ix. figs. 1–3.

Description.—Female. Length, 1·4 mm. ($\frac{1}{18}$th of an inch). Body elongate, slender. Anterior antennæ slender, nine-jointed. The seventh and eighth joints very small, the others of moderate length, as shown by the formula:—

$$\frac{13 \cdot 18 \cdot 13 \cdot 10 \cdot 8 \cdot 9 \cdot 3 \cdot 3 \cdot 12 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot}$$

Posterior antennæ short, two-jointed. Secondary branch small, one-jointed, and furnished with three terminal plumose setæ. Mandibles elongate, narrow. Apex obliquely truncate, armed with a large tooth in the middle and several small ones on each side. The basal joint of the mandible-palp is considerably dilated, with the proximal end forming a narrow stalk-like attachment to the base of the mandible; while the distal margin bears three short setæ. The secondary joint, or branch, of the palp is narrow, and about three times longer than broad, with a small marginal and four apical setæ. Posterior foot-jaws robust, and armed with a strong terminal claw (fig. 6). The first pair of swimming-feet are elongate and slender. The first joint of the inner branches, which is furnished with a plumose seta on the lower half of the inner margin, is rather longer than the second and third together. The second joint is little more than half the length of the third, and bears a small plumose seta on its inner distal angle. The outer branches, which are composed of three sub-equal joints, extend very little beyond the first joint of the inner branches. The inner branches of the next three pairs are short, and only extend to about the middle of the second joint of the elongate outer branches. The basal joint of the fifth pair is broadly triangular, and furnished with five terminal setæ; the second one of which, counting from the outside, is very long, being more than double the length of the seta on either side of it. The secondary joint is oblong-ovate in shape, its greatest breadth being equal to about two-fifths of the length, and there are five setæ of variable lengths ranged at intervals from the middle of the outer margin to the apex, in addition to a very long intero-sub-apical seta. The apex of the basal joint reaches to about the middle of the secondary one (fig. 10). Caudal stylets shorter than the last abdominal segment, and broadly pyriform. The principal tail setæ are as long as the abdomen.

Male.—Anterior antennæ ten-jointed. The fourth joint is narrower than the one that precedes or follows, and is hinged to the fifth; the sixth, and seventh, are very short, and the joints between the eighth and ninth, and between the ninth and tenth segments, appear to be hinged so that each antenna forms a powerful grasping organ (fig. 3). The inner branches of the third pair extend to the end of the second joint of the outer branches, and is furnished, in addition to the plumose marginal setæ, with a terminal spine-like appendage (fig. 9). The form of the fifth pair is somewhat similar to those of the female, but smaller, and without the very long seta on each of the basal and secondary joints. The sixth pair of appendages are very broad and short, in form somewhat like the segment of a circle, and furnished with one long and two short setæ.

Habitat.—At Seafield near Leith. Obtained by washing some black sandy mud near low-water mark.

Remarks.—This large and fine species is readily distinguished from any other British *Ameira* by the pyriform caudal stylets; and, on dissection, by the other characters referred to in the description.

*Ameira exigua,** sp. n. (Pl. VI. figs. 15, 23.)

Description.—Female. Length, ·47 mm. ($\frac{1}{53}$rd of an inch). Rostrum prominent. Anterior antennæ sparingly setiferous, rather slender, and eight-jointed. The second joint is longer, and the penultimate one shorter than any of the other joints. The proportional lengths of the joints are nearly as shown by the annexed formula:—

$$\frac{13 \cdot 16 \cdot 10 \cdot 7 \cdot 6 \cdot 6 . 3 \cdot 6 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot}$$

Posterior antennæ and mouth organs nearly as in *Ameira reflexa.* The first pair are moderately stout. The inner branches are of considerable length, but the outer branches are short, and do not reach the end of the first joint of the inner branches. The second joint of the inner branches is small, while the end joint is elongate and slender; but the second and third joints together are scarcely equal in length to the first joint (fig. 20). In the fourth pair the outer branches are long, and inner branches short; the inner branches scarcely extend beyond the end of the second joint of the outer branches (fig. 21). The fifth pair are foliaceous, small. The produced inner portion of the basal joint is broadly sub-conical, and furnished with five terminal and sub-terminal setæ; the second one, from the outside, is considerably longer than any of the others. The secondary joint is broadly ovate, and extends halfway beyond the end of the basal joint, and bears several setæ of unequal length round the outer margin and apex, but the inner margin is ciliated (fig. 22). Caudal stylets shorter than the last abdominal segment, and about as long as broad. The principal seta of each stylet is stout, and longer than the abdomen (fig. 23).

Habitat.—Off St Monans. Not very common.

Remarks.—This very small but distinct species somewhat resembles *Ameira exilis* and *Ameira longipes*, Boeck. It differs from one in being not only much smaller and comparatively more robust, and in the anterior antennæ being eight instead of nine-jointed, but also in the form of the mandible-palp and the structure of the fourth pair of swimming-feet, and from the other by the structure of the mandible-palp and the fifth pair of feet.

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* Exiguus = small.

Boeck, in the same year (1864)* in which he instituted the genera *Stenhelia* and *Ameira*, established a third genus, *Nitokra*, all three being closely allied to each other. Species belonging to the first two genera, but apparently none belonging to the last, have been recorded from the British seas ; at least I do not know of any record of a British *Nitokra*. In 1891 Dr W. Giesbrecht described † two new species of *Nitokra* that he had discovered amongst sea-weed in the estuary at Keil ; and in doing so he drew attention to the more important characters by which these three genera may be distinguished from each other. The characters are these :—

For *Stenhelia*, Boeck.—'Secondary branch of the posterior antennæ ' three-jointed. Mandible-palp with a distinct basal part, bearing ' two separate branches.

For *Ameira*, Boeck.—' Secondary branch of the posterior antennæ ' one-jointed. Mandible-palp one-jointed.'

For *Nitochra*, Boeck.—' Secondary branch of the posterior antennæ ' one-jointed. Mandible-palp two-jointed.'

If these definitions are to be considered satisfactory, the *Ameira longipes*, Boeck, as described and figured in the ' Monograph of the British ' Copepoda,' is a *Nitokra*, as the figure of the mandible-palp exhibits two distinct joints or branches ; and probably, also, are all the species described here as *Ameira*. The subject evidently requires further study, so far as the British *Stenheliinæ* are concerned ; and meantime I prefer to adhere to the generic definition of *Ameira* in the ' Monogragh of the British Cope- ' poda. '

Genus *Delavalia*, Brady (1868).

Delavalia reflexa, Brady and Robertson.

1875. *Delavalia reflexa*, Brady and Robertson (10), p. 196.

One or two specimens of this species were obtained among material dredged off Burntisland in November last year. Several other interesting species have been discovered here, one or two of which are described in the sequel.

Genus *Tetragoniceps*, Brady (1880).

(?) *Tetragoniceps consimilis*,‡ sp. n. (Pl. VII. figs. 4–12.)

Description.—Female. Length, ·85 mm. ($\frac{1}{30}$th of an inch). In general appearance very like *Tetragoniceps bradyi*, T. Scott. Rostrum prominent. Anterior antennæ slender, sparingly setiferous, and eight-jointed. The length of the first joint is at least equal to the combined length of the next three, and it bears a few small but distinct blunt pointed teeth on the upper margin. The upper distal angle of the second joint is produced forward into a prominent tooth (fig. 4). The formula shows the proportional lengths of the joints :—

$$\frac{28\cdot12\cdot7\cdot8\cdot4\cdot4\cdot4\cdot6\cdot}{1\cdot2\cdot3\cdot4\cdot5\cdot6\cdot7\cdot8\cdot}$$

Posterior antennæ elongate, slender, three-jointed ; the last joint is nearly as long as the other two together. A rudimentary secondary branch, furnished with a single apical seta, springs from the end of the first joint. The mandibles have the truncate biting part armed with several elongate

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* Oversigt, Norges Kyster, Copepoder, *Calanid. Cyclopid. og Harpactid.* (Christ.), 64.

† Die freilebenden Copepoden der Kieler Föhrde.

‡ Consimilis = very like.

sharp-pointed teeth, decreasing in size from the external edge. The basal part of the mandible-palp is comparatively large, becoming dilated outwardly, and bearing a few small marginal hairs. Apical joint elongate, narrow, with two marginal and four terminal setæ; the secondary marginal joint is very small (fig. 7). Posterior foot-jaws slender, the second joint elongate, end joint very small, terminal claw very slender (fig. 8). The first pair of thoracic feet somewhat like those of *Tetragoniceps bradyi*, but the inner branches are three-jointed, the first very long, the last two short. A small seta springs from near the distal end of the inner margin of the inner branches, and the third joint bears two moderately long and somewhat curved setæ at the apex. The outer branches are three-jointed, and do not reach the end of the first joint of the inner branches (fig. 9). Inner branches of the second, third, and fourth pairs short, and two-jointed; outer branches three-jointed, elongate, and slender (fig. 10). Fifth pair two-jointed. Basal joint short, broad, and somewhat produced exteriorly to an angular apex armed with two short spines; while two small setæ spring from the outer margin. Secondary joint very large and foliaceous, sub-quadrate in form, and one and a half times longer than broad, and bearing one small seta near the middle of the inner margin, and three short, stout, spiniform, and two small setæ on the obliquely truncate apex (fig. 11). Caudal stylets comparatively long and narrow, and about equal in length to the last abdominal segment, and furnished with five terminal setæ, two of them being stout and spiniform, the other three slender. One of the spiniform setæ is short, and springs from the outer edge of the stylet; the other is elongate, and forms the third from the outside.

Habitat.—Off St Monans, Firth of Forth. Rather scarce.

Remarks.—This species closely resembles *Tetragoniceps bradyi* in general appearance as well as in a few anatomical details, but there are important differences that may require its removal from the genus in which it is provisionally placed. Two very important differences are observed in the structure of the first and fifth pairs of thoracic feet. In the first pair the inner branches are three-jointed, and the fifth pair are two-branched. These two characters indicate a considerable divergence from the typical *Tetragoniceps*; but I prefer to leave it in that genus in the meantime, pending a further study of the species.

Genus *Laophonte*, Philippi (1840).

Laophonte depressa, sp. n. (Pl. VI. figs. 24–31; Pl. VII. figs. 1–3.)

Description.—Female. Length, ·84 mm. ($\frac{1}{30}$th of an inch). Body elongate, depressed sub-cylindrical. Breadth across the thorax equal to fully one-fourth of the length. The postero-lateral angles of the second, third, and fourth abdominal segments produced and rounded. Rostrum broad, with the apex rounded. Anterior antennæ sparingly setiferous, shorter than the first cephalo-thoracic segment, and composed of seven joints; the third joint is longer than any of the others, the fourth and fifth are small. The proportional lengths of the joints are shown by the formula:—

$$\frac{12 \cdot 11 \cdot 15 \cdot 5 \cdot 4 \cdot 6 \cdot 7 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot}$$

Posterior antennæ robust; the end joint is about equal in length to the preceding one, and bears a few stout slightly curved spines on the distal half of the upper margin and apex. A small secondary branch with four terminal plumose setæ springs from the middle of the first joint (fig. 2, Pl. VII.). Mandibles well-developed. The mandible-palp is comparatively small, and consists of a narrow elongate joint, with one marginal and one apical plumose hair, and is provided with a nearly obsolete subterminal second joint supporting three plumose setæ (fig. 25, Pl. VI.). The joints of the posterior foot-jaws are comparatively elongate and narrow. The terminal claw is strong, and slightly curved (fig. 26, Pl. VI.). The two-jointed inner branches of the first pair of thoracic feet are stout, and armed with a powerful terminal claw. The outer branches are small and three-jointed, and only extend to about the middle of the elongate first joint of the inner branches (fig. 27, Pl. VI.). The second, third, and fourth pairs are slender. The inner branches are short and two-jointed, with the first joint small. Both branches are furnished with long plumose setæ (fig. 28, Pl. VI.). The structure of the fifth pair is similar to those of *Laophonte thoracica*, Boeck; but the secondary joint is broader, the breadth being equal to about twofifths, of the length, and with the distal half sub-conical in outline (fig-. 30 Pl. VI.). Caudal stylets short, about equal to half the length of the last abdominal segment.

Male.—In the male the fourth joint of the anterior antennæ is dilated and sub-rotund. The terminal joints are narrow, and form a claw-like appendage; and, being hinged to the large fourth joint, constitute an efficient grasping organ (fig. 2, Pl. VII.). The third pair of thoracic feet are moderately stout; the inner branches appear to consist of three sub-equal joints that reach to about the end of the second joint of the outer branches. An irregularly-curved spiniform appendage, extending considerably beyond the apex of the last joint, springs from the end of the second joint, as shown in the figure (fig. 29, Pl. VI.). The basal joints of the fifth pair are not produced exteriorly, but the anterior angle is furnished with two plumose setæ. The secondary joint is shorter than that of the female fifth feet, and there is proximally a lobe-like marginal process, furnished with a terminal plumose seta. On the conical end of the secondary joint there are two stout setæ on the inner and two on the outer margin, and an elongate apical seta. The sixth appendage is small, narrow, and provided with three terminal plumose setæ (figs. 31, Pl. VI.).

Habitat.—Off St Monans and also off Musselburgh. Rather scarce.

Remarks.—This species resembles *Laophonte thoracica*, Boeck, in some of its characters, as, for example, in the form of the thoracic feet; but the structure of the anterior antennæ and posterior foot-jaws, and the short caudal stylets, distinguish it at a glance from that species.

Laophonte denticornis, sp. n. (Pl. VII. figs. 13–23.)

Description.—Female. Length, ·86 mm. ($\frac{1}{29}$th of an inch). Body seen from above, slender, sub-cylindrical; the first cephalo-thoracic segment nearly equal to the combined length of the next four. The postero-lateral angles of the second, third, and fourth abdominal segments are slightly produced and rounded; while the third and fourth segments are proximally narrower than they are distally. Forehead sub-triangular. Anterior antennæ six-jointed, stout, sparingly setiferous, and about equal in length to the first cephalo-thoracic segment. The first three joints are of moderate length and sub-equal, the fourth and fifth are small. The second joint is armed on the under side with a stout conical tooth nearly at right angles to the joint (fig. 14). The proportional lengths of the joints are shown by the formula:—

$$\frac{18\ .\ 16\ .\ 15\ \cdot\ 5\ \cdot\ 3\ \cdot\ 11\ \cdot}{1\ \cdot\ 2\ \cdot\ 3\ \cdot\ 4\ \cdot\ 5\ \cdot\ 6\ \cdot}$$

The fourth joint is produced on the upper side to form the base of a moderately long filament. The basal joint of the posterior antennæ is somewhat robust, and bears a short plumose seta near the middle of the upper margin. A small secondary joint, furnished with two marginal and two terminal plumose hairs, springs from the middle of the joint nearly opposite the marginal seta. The second joint is about equal in length to the first, but considerably narrower (fig. 16). The mandible-palp is small, narrow, one-jointed, and furnished with a few short plumose hairs (fig. 17). In the posterior foot-jaws the first joint is narrow; the second is considerably dilated, and furnished with a strong hooked claw, scarcely equal in length to the joint from which it springs. The inner branches of the first pair of swimming-feet are elongate and rather slender. The second joint is proportionally much longer than it is in several described species of *Laophonte*, being equal to fully one-third of the length of the first joint. Terminal claw slender, and only slightly curved. The outer branches, which consist of three sub-equal joints, are equal to about half the length of the first joint of the inner branches (fig. 19). The inner two-jointed branches of the fourth pair extend slightly beyond the end of the second joint of the outer branches (fig. 20). The inner portion of the basal joints of the fifth pair is produced into a sub-cylindrical lobe, obliquely rounded at the end, and provided with four plumose setæ arranged at nearly equal distances round the lower half and end of the inner edge. The secondary joints are small and cyclindrical in form, and furnished with five setæ on the irregular edge of the truncate apex (fig. 21). Caudal stylets narrow, and rather longer than the last abdominal segment.

Male.—The tooth on the under side of the second joint of the male anterior antennæ is scarcely so large as in the female. The terminal joints are modified somewhat like those of the male of *Laophonte depressa* (fig. 15). The inner branches of the third pair of thoracic feet are very short, and provided with a strong irregularly-curved spiniform appendage (fig. 21). The inner portion of the basal joints of the fifth pair are not produced, but are slightly bilobed, each lobe bearing a single apical seta. The secondary joints are somewhat similar to those of the female, but rather narrower (fig. 23). The sixth appendage is very small, and furnished with two short hairs.

Habitat.—Off St Monans. Rare.

Remarks.—The slender form of this species, considered in connection with the armature of the anterior antennæ, is alone sufficient to enable it to be distinguished from others of the same genus. It is unlike any other *Laophonte* known to me, except, perhaps, *Laophonte serrata* (Claus).

Laophonte littorale, T. and A. Scott.

1893. *Laophonte littorale,* T. and A. Scott, p. 238, pl. xi. figs. 7–14.

Description.—Female. Length, ·85 mm. ($\frac{1}{30}$th of an inch). Body elongate, sub-cylindrical. Forehead very slightly produced into a bluntly rounded rostrum Anterior antennæ sparingly setiferous, and composed of seven joints; the third joint is longer and the fifth shorter than any of the others. The proportional lengths of all the joints are shown by the formula:—

$$\frac{9 \cdot 10 \cdot 12 \cdot 5 \cdot 3 \cdot 6 \cdot 8 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 .}$$

Secondary branch of posterior antennæ rudimentary, and consisting of one small joint bearing a small apical seta. Mouth organs nearly as in *Laophonte curticauda*, Boeck. Inner branches of the first thoracic feet moderately stout. The second joint is scarcely equal to one-fourth of the length of the first, and the terminal claw is stout and hooked at the apex.

Outer branches slender, three-jointed, and equal to nearly three-fifths the length of the first joint of the inner branches. Inner branches of the second, third, and fourth pairs, short, two-jointed; those of the fourth pair scarcely reach beyond the end of the first joint of the outer branches. The outer branches of the fourth pair are short, stout, and very setose. In the fifth pair both joints are broadly foliaceous and sub-quadrate, and bear a number of strongly plumose terminal setæ. Caudal stylets equal to one and a half times the length of the last abdominal segment, and clothed with minute hairs.

Male.—Anterior antennæ very robust. The three last joints, which together form a claw-like appendage, are joined to the preceding joint by a strong hinge-like process, by which they can be folded back upon that joint, thus forming a powerful grasping organ. The inner branches of the fourth pair of thoracic feet are very rudimentary, and consist of two minute joints; the outer branches are three-jointed and robust. The first joint is considerably longer than the next two together. The first and second joints are each armed with a stout spine at the distal end; while the last joint bears three spines, one small and two large, as shown in the figure. Fifth pair rudimentary, consisting of a slightly produced basal portion carrying four setæ on small basal projections, and a minute spine on the inner margin. The sixth appendage consists of a small bilobed process, each lobe bearing a stout apical seta.

Habitat.—In pools of brackish water at the mouth of a small stream near Aberlady, Firth of Forth; and in similar pools at the mouth of the River Alness, near Invergordon, Cromarty Firth.

Remarks.—This species somewhat resembles *Laophonte curticauda*, Boeck. The outer branches of the male fourth thoracic feet are not very unlike those of the male third pair of that species, but the structure of the inner branches is very different. *Laophonte littorale* appears to be confined to localities where the water is more or less brackish.

(?) *Laophonte simulans*,* sp. n. (Pl. VII. figs. 24–32; Pl. VIII. fig. 1).

Description.—Female. Length ·43 mm. ($\frac{1}{58}$th of an inch). Body seen from above, broadly ovate, depressed. Forehead produced into a broad blunt-pointed rostrum. Anterior antennæ robust, shorter than the first cephalo-thoracic segment, six-jointed. The third joint is considerably longer than any of the others, while the fourth and fifth are small; a long slender filament springs from the fourth joint (fig. 1, Pl. VIII.). The proportional lengths of the joints are shown by the formula:—

$$\frac{14 \cdot 18 \cdot 23 \cdot 5 \cdot 3 \cdot 12 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot}$$

Basal joint of posterior antennæ robust. Second joint shorter and much narrower. Secondary branch short, bearing four terminal plumose setæ (fig. 25, Pl. VII.). Mandible elongate, slender, and provided with a small one-jointed palp (fig. 26, Pl. VII.). Posterior foot-jaws stout, armed with a powerful strongly curved terminal claw, rather shorter than the joint from which it springs (fig. 27, Pl. VII.). Inner branches of the first pair of thoracic feet elongate and robust. A small blunt-pointed spine springs from near the distal end of the first joint. The second joint is short, being only equal to about one-fifth of the length of the first joint. Terminal claw stout, and strongly hooked at the end. Outer branches are slender and three-jointed, and about two-thirds the length of the first joint of the inner branches. The second and third pairs are moderately stout, and have the inner branches two and the outer three-jointed,—the inner branches being shorter than the outer (fig. 28, Pl. VII.). In the fourth pair the inner

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* Simulans = mimicking.

branches consist of one and the outer of two joints, as shown in the figure (fig. 29, Pl. VII.). The inner portion of the basal joint of the fifth pair is not developed, but looks like a flattened border to the thoracic segment to which it is attached. It is furnished with three marginal setæ ; the outer portion projects outwards in the form of an elongate narrow process carrying a slender apical seta. The secondary joint has an obovate form, and is provided with five setæ of variable lengths round the distal end (fig. 30, Pl. VII.). Caudal stylets short, with a considerable space between them. The thoracic and abdominal segments are all fringed more or less with cilia.

Habitat.—Off West Wemyss, Firth of Forth. Rare.

Remarks.—This small and very curious species was discovered within the valves of a dead *Cyprina* shell, accidentally picked out from among some trawl refuse. It seems to combine the form of one of the depressed *Dactylopus* with the anatomical characters of *Laophonte.* It differs, however, from the typical *Laophonte* in the structure of the third pair of swimming-feet, which in this species have the inner branches one and the outer branches two jointed. It also carries two ovisacs, which is very unusual among the *Laophonte.* It nevertheless agrees in so many particulars with the characters of that genus, that I propose, for the present at least, to place it among the *Laophonte. Laophonte simulans* is, so far, one of the smallest of the Forth species belonging to this genus.

Sub-genus *Laophontodes*, nov. sub-gen.

Like *Laophonte*, Philippi, except that the posterior antennæ have no secondary branch, and the fifth pair of thoracic feet are one-jointed. In the second, third, and fourth pairs of thoracic feet the second basal joints are elongate, and the outer branches are articulated to the apex, and the inner branches to the margin, and near the proximal end of the basal joint. The two branches are more widely apart than is usual in the genus *Laophonte.*

Laophontodes typicus, sp. n. (Pl. VIII. figs. 2–8.)

Description.—Female. Length, ·4 mm. ($\frac{1}{6 \cdot 2}$nd of an inch). Body seen from above, narrow, elongate ; the breadth gradually decreasing towards the posterior end. All the segments more or less angular. The first cephalo-thoracic segment is nearly quadrangular in outline ; the middle part of the front margin is produced to form a broad sub-truncate rostrum. Anterior antennæ short, five-jointed. All the joints are comparatively elongate, except the fourth, which is very small. The formula shows the proportional lengths of the joints:—

$$\frac{5 \cdot 6 \cdot 7 \cdot 1 \cdot 5 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot}$$

Posterior antennæ two-jointed, and of moderate size ; no secondary appendage (fig. 4). Posterior foot-jaws small, three-jointed ; the end joint very small. Terminal claw slender, slightly curved at the apex (fig. 5). First pair of thoracic feet like those of *Laophonte.* Second joint of the inner branches is scarcely equal to one-third the length of the first joint. Terminal claw slender, strongly hooked at the end. A small seta springs from the base of the claw. Outer branches three-jointed ; the first and second joints sub-equal, the third shorter, the entire outer branch is equal to fully half the length of the first joint of the inner branch (fig. 6). Inner branches of the second, third, and fourth pairs short, two-jointed, and articulated to the second basal joint near its proximal end. The first joint of the inner branches is very small, the other is elongate. Outer branches elongate, three-jointed, and articulated to end of the elongate, narrow, second basal joint; the outer and inner branches being thus widely apart (fig. 7). Fifth pair one-branched, narrow, elongate, and furnished with one seta near the middle of the inner margin, three on the outer margin, and three at the apex (fig. 8). Caudal stylets long and narrow, being equal to one and a half times the length of the last abdominal segment, and each furnished with a stout apical seta and a few minute hairs.

Habitat.—Vicinity of Inchkeith. Rare.

Remarks.—This curious species was dredged at the north end of the Island of Inchkeith. Very few specimens were obtained.

Genus *Normanella*, Brady (1880).

Normanella dubia (Brady and Robertson).

1875. *Laophonte dubia*, Brady and Robertson (10), p. 196.
1880. *Normanella dubia*, Brady (8), vol. ii. p. 87, pl. lxxviii. figs. 12–22.
1893. *Normanella dubia*, I. C. Thompson (33), p. 26, pl. xxi. fig. 6.

Habitat.—Off Musselburgh. Not very scarce, but easily overlooked. *Normanella dubia* seems to be widely distributed in the British seas.

Genus *Cletodes*, Brady (1872).

Cletodes irrasa, T. and A. Scott.

1894. *Cletodes irrasa*, T. and A. Scott (31), p. 141, pl. viii. figs. 8–12.

Description.—Female. Length, ·8 mm. ($\frac{1}{30}$th of an inch). Body elongate, cylindrical. All the segments, except the first, furnished with a fringe of small hairs around, but a little in front of, the posterior margin. Anterior antennæ stout, shorter than the first body segment, and composed of six joints; the second and last joints are longer than any of the others, the fifth is very small. The proportional lengths of all the joints are shown by the formula:—

$$\frac{20 \cdot 26 \cdot 20 \cdot 10 \cdot 3 \,.\, 24 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot}$$

Posterior antennæ three-jointed. A small secondary branch bearing a single apical seta springs from the end of the first joint. Inner branches of the first pair of thoracic feet, which are composed of two sub-equal joints, reach to about the middle of the second joint of the outer branches, and bear two short apical setæ. Inner branches of the fourth pair, which are also two-jointed, shorter than the first joint of the elongate outer branches. The inner portion of the basal joint of the fifth pair is in the form of a shallow lobe, carrying two long and one short seta. Secondary joint narrow and elongate, and furnished with one marginal and four terminal setæ. Caudal stylets slender, equal in length to the last abdominal segment, each with two small setæ on the inner and one on the outer margin, and a few apical setæ.

Habitat.—Vicinity of the Bass Rock. Rather rare.

Cletodes curvirostris,* sp. n. (Pl. VIII. figs. 18–26.)

Description.—Female. Length, ·9 mm. ($\frac{1}{28}$th of an inch). Body subcylindrical, usually arcuate when seen from the side. Rostrum short, stout, recurved. Anterior antennæ robust, short, and composed of six joints. The third is considerably larger and the fifth smaller than any of the other joints, as shown by the annexed formula, which indicates approximately the proportional lengths of all the joints :—

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* Referring to the recurved rostrum.

$$\frac{7 \cdot 7 \cdot 11 \cdot 4 \cdot 2 \cdot 8 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot}$$

Posterior short and stout. Secondary appendage represented by a single small plain seta which springs from near the middle of the first joint. A small plumose seta springs from exterior margin of the same joint (fig. 20). Mandibles armed with a number of spiniform teeth, the middle one being larger than the others. Palp small, one-jointed, provided with one marginal and two terminal plumose setæ ; and a peculiar appendage, bifid at the apex, springs from a small marginal lobe (fig. 21). Posterior foot-jaws very small, with a slender terminal claw. The inner branches of the first pair of swimming-feet are composed of two nearly equal joints, the second one being only slightly longer than the other. The inner branches are about two-thirds of the length of the outer three-jointed branches. A stout setose spine springs from the inner distal angle of the second basal joint (fig. 22). Inner branches of the fourth pair small, scarcely equal in length of the first joint of the outer three-jointed branches, and composed of two joints, the first joint shorter than the other. All the swimming-feet are short and stout. Basal joints of the fifth pair small ; the produced interior portion is rather short and narrow, and provided with three stout setæ—one marginal and two terminal. A slender seta, articulated near the middle, springs from the exterior angle. Secondary joints elongate, narrow, sub-cylindrical, bearing a stout terminal seta and two smaller marginal setæ, all three being plumose (fig. 25). Caudal stylets moderately stout, rather longer than the last adominal segment. Each stylet is furnished with a small seta near the middle of the outer margin in addition to a few terminal setæ.

Habitat.—Largo Bay. Not unfrequent.

Remarks.—This species resembles *Enhydrosoma curvata* in general appearance, but in structural details it is clearly a *Cletodes.*

* Genus *Pontopolites*, nov. gen.

Animal somewhat resembling *Dactylopus* in general form. Anterior antennæ five-jointed ; shorter than the first body segment. Posterior antennæ like those of *Cletodes*, but the secondary branch is two-jointed. Mandible-palp small ; composed of a distinct basal part and two small one-jointed branches, the posterior one being rudimentary, or nearly so. Maxillæ and anterior and posterior foot-jaws as in *Cletodes.* First pair of swimming-feet somewhat similar to those of *Attheyella pygmæa* (G. O. Sars) (= *Attheyella cryptorum*, Brady). The inner branches, which are composed of two nearly equal joints, are of about the same length as the outer three-jointed branches (fig. 14, Pl. IV.). The inner branches of the second, third, and fourth pairs consist of a single and more or less rudimentary joint. The fifth pair are one-branched. One ovisac.

Pontopolites typicus, sp. nov. (Pl. VIII. figs. 9–17.)

Description.—Female. Length, ·6 mm. ($\frac{1}{42}$nd of an inch). Body elongate, sub-cylindrical. Rostrum short, subtriangular, with the apex bluntly rounded. A minute seta springs from a small notch on each side of the apex. Anterior antennæ short, stout, five-jointed, the fourth joint very small. The proportional lengths of the joints are shown by the formula :—

$$\frac{16 \cdot 12 \cdot 14 \cdot 4 \cdot 15 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot}$$

The small two-jointed secondary branch of the posterior antennæ springs

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* Ποντος, the sea ; Πολιτης, a citizen.

from near the base of the first joint (fig. 11). The basal part of the mandible-palp bears two spinulose setæ at the apex. The primary branch is furnished with one marginal and three terminal setæ, while the secondary branch consists of a small papilla bearing a single small hair. Posterior foot-jaws short, stout, two-jointed, and armed with a moderately long terminal claw. First pair of swimming-feet short, moderately stout; both branches of nearly equal length; the inner branches composed of two, the outer of three sub-equal joints (fig. 14). The first pair closely resemble those of *Attheyella pygmæa* (G. O. Sars). Inner branches of second, third, and fourth pairs small, one-jointed. Those of the fourth pair rudimentary, and bearing a short terminal spine. Outer branches elongate, the third joint being nearly equal to the combined length of the other two (fig. 15). The fifth pair consist each of a single joint (or branch), sub-quadrangular in form, but rather longer than broad, and extends obliquely outwards from its attachment to the fifth thoracic segment. A number of long stout plumose setæ fringe the oblique exterior margin, while a few plain setæ spring from the truncate apex, as shown in the figure (fig. 16). Caudal stylets very short.

Habitat.—Off Musselburgh. Not common.

Genus *Heteropsyllus*,* nov. gen.

Body sub-cylindrical. Anterior antennæ shorter than the first body segment, and composed of five joints. Posterior antennæ like those of *Cletodes*, but the secondary branch consists of two joints. Mandible-palp small, with a distinct basal part bearing two small branches. Mouth organs as in *Pontopolites*. Both branches of the first pair of swimming-feet three-jointed, the inner being rather longer than the outer branches. Inner branches of the second, third, and fourth pairs two-jointed, and considerably shorter than the elongate three-jointed outer branches. Fifth pair two-branched. Foliaceous. One ovisac.

Heteropsyllus curticaudatus, sp. n. (Pl. VIII. figs. 27–34; Pl. IX. fig. 1.)

Description.—Female. Length, ·5 mm. ($\frac{1}{50}$th of an inch). Body elongate, sub-cylindrical. Forehead produced into a short rostrum (fig. 27, Pl. VIII.). Anterior antennæ stout, shorter than the first cephalo-thoracic segment, and composed of five joints, the fourth being very short. The approximate proportional lengths of the joints are shown by the formula:—

$$\frac{10 \cdot 9 \cdot 7 \cdot 3 \cdot 14 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot}$$

The two-jointed secondary branch of the posterior antennæ is furnished with four small setæ,—one at the end of the first joint, a marginal and two terminal setæ on the second joint (fig. 29, Pl. VIII.). Mandible-palp small, but distinctly two-branched (fig. 30, Pl. VIII.). Posterior foot-jaws small, and in form somewhat similar to those of the species last described. Both branches of the first pair of swimming-feet composed of three sub-equal joints, the inner rather longer than the outer branches (fig. 32, Pl. VIII.). Outer branches of the second, third, and fourth pairs elongate and three-jointed, somewhat slender. The third joint of all the outer branches is longer than either the first or second joints. Inner branches shorter than the outer, and two-jointed; those of the fourth pair scarcely longer than the first joint of the outer branches (fig. 33, Pl. VIII.). The basal joints of the fifth pair are large, broadly but somewhat obliquely rounded at the distal end, and provided with five terminal setæ ranged at more or less equal distances from each other round the apex and lower inner margin.

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* Ἕτερος, different; ψυλλος, a flea.

The seta on the outside is plain, the others are plumose. Secondary joints small, sub-cylindrical, scarcely extending beyond the end of the basal joints. Bordering upon the concave exterior margin of the basal joints, and near the proximal end of the secondary joints, there is a clearly defined lucid space of a somewhat semi-circular outline (fig. 1, Pl. V.). Caudal stylets very short, the breadth about equal to the lengths. The stylets, being comparatively narrow, are widely apart; and as the last abdominal segment, as seen from the side, ends abruptly, the stylets, though short, are quite prominent (see figs. 27 and 34, Pl. VIII.).

Habitat.—Off Musselburgh and off Aberdour. Frequent.

Remarks.—This is a well-marked species. When mixed up with other forms it is readily distinguished by the abrupt junction of the stylets to the last abdominal segment. Though moderately frequent, both in material dredged off Musselburgh and Aberdour, no males have yet been obtained.

Genus *Nannopus*, Brady (1880).

Nannopus palustris, Brady.

1880. *Nannopus palustris*, Brady (8), vol. ii. p. 101, pl. lxxvii. figs. 18–20.
1892. *Nannopus palustris*, Canu (11), p. 166, pl. iv. figs. 6–21.

Habitat.—In pools near the mouth of Cocklemill Burn—a small stream that enters the Forth at the east end of Largo Bay. The mouth of this stream is comparatively narrow, but immediately beyond the outlet there is a large expanse of low-lying ground intersected by numerous furrows or ditches branching off from the main channel of the stream; a considerable portion of this low-lying ground is covered by the sea at high-water, and especially during spring tides. This tidal lagoon, as it may be called, appears to harbour a peculiar and interesting micro-fauna, which has not hitherto been very carefully worked up. Some material was collected here by hand-net in August 1890, but it was not till a few months ago that there was sufficient leisure to attend to it. It was then ascertained that this curious species was not unfrequent in the material. *Nannopus palustris* was discovered by Dr Brady, also, in brackish-water pools, at Seaton Sluice, Northumberland, where only a few specimens were obtained. Dr Eugene Canu records this species also from Wimereaux, France, where it also occurs in somewhat similar conditions to those described above. The rudimentary structure of the inner branches of the third and fourth pairs of feet appear to be characteristic of the species.

Genus *Leptopsyllus*,* nov. gen.

Body elongate, cylindrical, somewhat similar in form to *Cylindropsyllus*, Brady. Anterior antennæ eight-jointed, short. Posterior antennæ three-jointed; secondary branch small, one-jointed. Mandibles well-developed, the broad biting part armed with several strong teeth. Palp comparatively large, consisting of a moderately stout basal joint, and a single two-jointed branch. Other mouth appendages nearly as in *Cletodes*, except that the posterior foot-jaws are three-jointed. Both branches of the first pair of swimming-feet short and two-jointed. In the second and third pairs the inner branches are obsolete or entirely absent, but the outer branches are three-jointed. Inner branches of the fourth pair two-jointed; outer branches three-jointed. Fifth pair foliaceous, small, two-branched.

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* Λεπτος, slender; and ψυλλος, a flea.

Leptopsyllus typicus, sp. n. (Pl. IX. figs. 2–11.)

Description.—Female. Length, ·74 mm. ($\frac{1}{34}$th of an inch). Anterior antennæ eight-jointed, short and robust; the fifth, sixth, and seventh joints are shorter than any of the others. The formula shows the proportional lengths of the joints:—

$$\frac{13 \cdot 10 \cdot 6 \cdot 3 \cdot 2 \cdot 2 \cdot 2 \cdot 5 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot}$$

Posterior antennæ composed of three moderately long joints; and the small one-jointed secondary branch springs from near the end of the first joint (fig. 4). The two-jointed branch of the mandible-palp has the first joint elongate, and furnished with a marginal second joint, very short, and provided with three terminal hairs (fig. 5). Maxillæ as in *Cylindropsyllus.* Anterior foot-jaws stout, two (or three) jointed, furnished with three marginal processes, each with two small spinulose terminal setæ; the distal end of the second joint is produced, and supports a stout curved spine. In a notch near the distal end of the second joint there is what looks like a rudimentary third joint, from which spring three small setæ (fig. 6). Posterior foot-jaws slender, three-jointed, the end joint small. The terminal claw is very long and slender, and is accompanied by a spiniform seta nearly equal to half the length of the claw (fig 7). Both branches of the first pair of swimming-feet are short and two-jointed, and somewhat widely apart; the second joint is rather shorter than the first in both branches (fig. 8). The second and third pairs are only one-branched, the inner branches being apparently entirely absent. Each branch consists of three joints, the middle one being shorter than the one on either side. The first two joints are each armed with a moderately stout slightly curved spine on the outer distal angles, while the last joint carries two terminal spines (fig. 9). In the fourth pair the inner branches are slender and two-jointed. The end joint is small, and provided with a moderately stout terminal spine. The outer branches are three-jointed. The joints are sub-equal, and armed similar to those of the second and third pairs (fig. 10). Fifth pair small and foliaceous. Each consists of a basal and a secondary joint. The inner portion is produced into a sub-cylindrical lobe, rounded at the end, and bearing two terminal hairs. The outer portion is also produced, but not so much as the inner portion, and bears one hair. The small secondary joint is situated in the hollow between the two produced portions of the basal joint, and is furnished with three terminal hairs (fig. 11). Caudal stylets elongate, and each composed of two distinct joints. The first joint is about one and a half times the length of the last abdominal segment, and about three times longer than broad, and has the inner distal angle produced into a blunt-pointed tooth-like process. The second joint (or appendage to the stylets) is of an elongate oval form, and equal to about one-third the length of the first joint to which it is attached by a narrow hinge-like articulation.

Habitat.—West of Queensferry. Washed from lumps of hardened mud composed of the agglutinated tubes of a species of *Sabella.* Rare. No males have yet been observed.

Genus *Dactylopus*, Claus (1863).

Dactylopus stromii (Baird).

1850. *Canthocamptus stromii*, Baird (2), p. 208, pl. xxvii. fig. 3.
1880. *Dactylopus stromii*, Brady (8), p. 3, pl. lv. figs. 1–13.
1892. *Dactylopus stromii*, Canu (11), p. 159.
1893. *Dactylopus stromii*, I. C. Thompson (33), p. 27, pl. xxii. fig. 4 *a*, *b*.

Habitat.—Off Limekilns, west of Queensferry. Washed from lumps of hardened mud. Not very common.

This species appears to be extensively distributed throughout the British Islands.

Dactylopus coronatus, sp. n. (Pl. IX. figs. 12–20.)

Description.—Female. Length, ·57 mm. ($\frac{1}{44}$th of an inch). Body moderately robust. Anterior antennæ short, stout, six-jointed, and bearing numerous elongate and stout, plain, and spinulose setæ (fig. 13). The ante-penultimate joint is rather shorter than any of the others, and bears a long stout filament. The formula shows the proportionate lengths of the joints:—

$$\frac{13 \cdot 17 \cdot 12 \cdot 8 \cdot 11 \cdot 10 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot}$$

Posterior antennæ short and stout. Secondary branch two-jointed, strongly setiferous. Mandibles somewhat like those of *Dactylopus tisboides*, Claus. The biting part is armed with a broad trifid tooth, two spiniform teeth, and a few setiferous spines (fig. 15). Posterior foot-jaws robust. A strong setiferous spine springs from the inner distal angle of the first joint. Terminal claw stout, curved, scarcely equal in length to the joint from which it springs. Both joints are furnished with rows of cilia, as shown in the figure (fig. 16). All the swimming-feet are short and stout, but those of the first pair are more robust than the others. The first joint of the inner branches of the first pair is considerably dilated, and longer than the next two together, and furnished with a plumose seta near the middle of the inner margins. The second and third joints are sub-equal, and much narrower than the first joint. The second joint bears a seta similar to that of the first joint. The third joint bears a small marginal plumose seta, a terminal plumose seta, and two elongate curved terminal spines. The outer branches are nearly equal to the length of the first two joints of the inner branches. The first two joints are sub-equal, but the last is only about two-thirds the length of the preceding one (fig. 17). The middle joint of the outer branches is furnished with a long plumose seta near the end of the inner margin. The spines on the outer margins of the first and second joints are moderately stout and setiferous. The outer one of the five terminal spiniform setæ is about the same length as the marginal spines, but the others become gradually more elongate, so that the inner one is fully three times the length of the outer (fig. 17). The inner branches of the second, third, and fourth pairs are shorter than the outer branches, and both are furnished with several plumose setæ on the inner margins, while the outer margins are strongly ciliate. The marginal spines of the outer branches are all more or less setiferous (fig. 18). The fifth pair are each indistinctly two-branched (or two-jointed) and foliaceous. The joints are sub-equal, and are each furnished with five stout plumose setæ of various lengths round the distal end. Caudal stylets short. One ovisac.

Habitat.—Among dredged material from the Rath ground in the vicinity of the Bass Rock; also in dredged material from Largo Bay. Not common.

Remarks.—The structure and armature of the anterior antennæ are alone sufficient to distinguish this from other species of *Dactylopus*.

Genus *Thalestris*, Claus (1863).

Thalestris forficuloides, T. and A. Scott. (Pl. X. figs. 13–25.)

1894. *Thalestris forficuloides*, T. and A. Scott (31), p. 142, pl. ix. figs. 4–9.

Description.—Female. Length, 73 mm. ($\frac{1}{34}$th of an inch). Anterior antennæ nine-jointed, and bearing long slender setæ. The proportional lengths of the joints are shown in the formula:—

$$\frac{15 \cdot 18 \cdot 13 \cdot 10 \cdot 8 \cdot 11 \cdot 6 \cdot 5 \cdot 11 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot}$$

The secondary branches are composed of two moderately long joints. Mandibles with the oblique biting edge coarsely serrate. Mandible-palp with a moderately large, stout, basal part, and two small branches (fig. 16). Maxilla-palp with three small narrow branches, each bearing two to three slender apical setæ (fig. 17). Posterior foot-jaws short, moderately stout; the last joint somewhat ovate, bearing a slender seta near the middle of the inner margin. Terminal claw slender, gently curved (fig. 19). The first pair of swimming-feet slender. Inner branches considerably longer than the outer. The inner terminal claw of both branches is comparatively very long and slender (fig. 20). In the fourth pair the inner branches reach slightly beyond the second joint of the outer branches. The last joint of the inner branches is about equal to three-fourths of the entire length of the other two joints, and the length of the last joint of the outer branches is nearly equal to that of the first and second together (fig. 21). The basal joints of the fifth pair are broadly triangular, and the apex reaches to near the middle of the secondary joints. They are furnished with three plumose setæ on the inner distal margin, and a moderately long terminal and small sub-terminal setæ. Secondary joints sub-cylindrical, and bearing eight setæ,—three on the inner and three on the outer distal margin, and two at the apex. Both margins of both joints are fringed with cilia (fig. 23). Caudal stylets very short. All the body segments are fringed with cilia round the posterior margin.

Male.—Anterior antennæ apparently eight-jointed, hinged between the second and third and between the fifth and sixth. The first three joints are sub-equal, and the fifth and last are about equal in length to that of the first three, but are narrower; while the fourth and seventh are smaller than those that preceed or follow. The inner branches of the third pair in the male are provided with an elongate spiniform appendage, slightly hooked at the end (fig. 22). The basal joint of the fifth pair is furnished with only two small spiniform setæ. The secondary branch is somewhat like that of the female, but rather smaller.

Habitat.—At Seafield, near Leith, among mud near low-water mark. This species resembles *Thalestris forficula*, Claus, but differs in several important particulars,—it differs in the proportional lengths of the joints of nine-jointed anterior antennæ; it also differs in the structure of the swimming-feet, as shown by the description and figures.

Genus *Pseudowestwoodia*, nov. gen.

Very like *Westwoodia* in general appearance when seen from the side. Anterior antennæ six or seven-jointed. Secondary branch of posterior antennæ small, one-jointed. Mouth appendages similar to those of *Westwoodia.* Both branches of first pair of swimming-feet two-jointed, but in general appearance the first pair resemble those of *Westwoodia.* The other thoracic appendages are similar in structure to those of that genus. The distinctive characters of *Pseudowestwoodia* are the one-jointed secondary branch of the posterior antennæ, and the first pair of swimming-feet with both branches two-jointed. All the other characters are more or less similar to those of *Westwoodia,* hence the proposed generic name for the form now under consideration.

Considering the many points of resemblance between the characters of the species now to be described and those of the genus *Westwoodia,* a strong desire was felt to include it in that genus; but it was clearly perceived that in order to do so a considerable modification of the definition of that genus would be necessary. In *Westwoodia* the secondary branch of the posterior antennæ is *two-jointed*, and the first pair of swimming-feet have the inner branches *three* and the outer only *one-jointed.*

Pseudowestwoodia andrewi,* sp. n. (Pl. IX. figs. 21–29.)

Description.—Female, ·46 mm. ($\frac{1}{54}$th of an inch). Body similar to *Westwoodia nobilis* (Baird) in general appearance, but smaller. Anterior antennæ six-jointed, slender, and sparingly setiferous The first three and last joints are elongate, while the fifth is smaller than any of the others. The proportional lengths of the joints are as follows :—

$$\frac{9 \cdot 11 \cdot 11 \cdot 6 \cdot 4 \cdot 12 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot}$$

The posterior antennæ consist of two sub-equal joints. The small one-jointed secondary branch springs from near the middle of the first joint (fig. 23). Mandible-palp with a moderately large basal joint bearing two small one-jointed apical branches, each branch furnished with several slender setæ (fig. 24). Posterior foot-jaws moderately stout. Terminal claw slender, rather longer than the joint from which it springs. The first joint bears a small seta near its inner distal angle, and a similar seta springs from about the middle of the inner margin of the second joint (fig. 25). The outer branches of the first pair of swimming-feet are about equal to half the entire length of the inner branches, and composed of two sub-equal joints. The first joint is armed with a stout spine at the outer distal angle, while the second joint bears a similar spine near the middle of the outer margin. One small seta near the lower part of the inner margin, and two spiniform setæ at the apex. The first joint of the inner branches is moderately stout and elongate, and becomes narrower towards the distal end. A long plumose seta springs from the inner margin at about one-third of the length of the joint from the proximal end. The second is small and narrow, and only equal to about one-fourth of the length of the first joint, and furnished with two slender, moderately elongate and spiniform apical setæ. A stout spine springs from both the inner and outer distal angles of the second basal joints (fig. 26). The second, third, and fourth pairs are nearly as in *Westwoodia nobilis* (Baird). The fifth pair are small and foliaceous. The length of the produced inner portion of the basal joint is scarcely equal to the breadth of the proximal end. Distal end broadly truncate, and furnished with four spiniform setæ and a short moderately stout spine—the spine being at the exterior angle. Secondary joints small, extending little beyond the end of the produced inner portion of the basal joints; sub-quadrangular in form, and armed with three short but strong dagger-shaped spines on the somewhat obliquely truncate end, and a small spine and a spiniform seta on the distal part of the inner margin (fig. 28). Caudal stylets very short. A short stout spine springs from the outer distal angle of each stylet, and the inner of the two principal tail setæ is about one-third longer than the other.

Habitat.—Off Burntisland. Frequent. Among material dredged in three or four fathoms water.

Remarks.—This small but interesting species is readily distinguished from others, even without dissection, when examined under the microscope, by the peculiar armature of the fifth pair of thoracic feet. It seems to have affinities with *Westwoodia* on the one hand and with *Harpacticus* on the other, and forms a connecting-link between them.

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* The species is so named in compliment to my son, Andrew Scott, to whose painstaking and ever-ready assistance and facile pencil I owe so much of my success among the *Copepoda.*

A second species of *Pseudowestwoodia* has lately been discovered in material from Cromarty Firth. It differs from that now described in the structure of the anterior antennæ, and in the armature and form of the first and fifth feet. This species is to be described later on.

Family LICHOMOLGIDÆ.

Genus *Pseudanthessius*, Claus (1889).

[*Lichomolgus*, Thorell (Pars) 1859].

Pseudanthessius liber (Brady and Robertson).
1875. *Lichomolgus liber*, Brady and Robertson (10), p. 197.
1880. *Lichomolgus liber*, Brady (8), vol. iii. p. 44, pl. lxxxvi. figs. 1–13.
1893. *Lichomolgus liber*, I. C. Thompson (33), p. 33, pl. xxv. figs. 2 *a*, *b*.

Habitat.—Vicinity of Inchkeith (north end). Scarce.

As has been pointed out by Dr Canu (*Les Copepodes du Boulonnais*, p. 241), one of the principal characters by which *Pseudanthessius*, Claus, is distinguished from *Lichomolgus* proper, is the structure of the fourth pair of thoracic feet, the inner branches of which, in *Pseudanthessius*, are only one-jointed, and furnished with two terminal setæ. In *Lichomolgus* proper, the inner branches of the same pair of feet are two-jointed, and the first joint has a seta on the inner distal angle, while the second carries two spines or spiniform setæ at the apex. According to this arrangement the following British species of the *Lichomolgidæ* will be included in the genus, *Pseudanthessius*, Claus.

Pseudanthessius liber (Brady and Robertson), as recorded above.
Pseudanthessius thorellii (Brady and Robertson), (= *Lichomolgus thorellii*, Brady and Robertson).
Pseudanthessius gracilis, Claus.
Pseudanthessius sauvagei, Canu.

The last three, as well as the first, have been obtained in the Forth, and will be referred to in the sequel.

The following British species of the *Lichomolgidæ* will be included in *Lichomolgus* proper :—

Lichomolgus fucicolus, Brady.
Lichomolgus furcillatus, Thorell.
Lichomolgus forficula, Thorell.
Lichomolgus albens, Thorell.
Lichomolgus hirsutipes, T. Scott. (Firth of Forth.)
Lichomolgus agilis, Leydig (= *Lichomolgus concinnus*, T. Scott. Firth of Forth.)

The following species of the *Lichomolgidæ* have also been recorded from the British seas :—

Sabelliphilus sarsi, Claparide (recorded by I. C. Thompson, Liverpool).

Species belonging to *Sabelliphilus* have the inner branches of the fourth pair of swimming-feet three jointed, and furnished with two barbed setæ on the inner margin, and two slender smooth setæ at the distal extremity. The first two joints of the anterior antennæ in *Sabelliphilus* are considerably dilated.

Herrmannella rostrata, Canu (1891) [= *Lichomolgus agilis*, T. Scott (1892). Firth of Forth.]

The structure and armature of the inner branches of the fourth pair in *Herrmannella* are somewhat similar to those of *Sabelliphilus*, but the first two joints of the anterior antennæ are cylindrical and not swollen as in that genus.

Modiolicola insignes, Aurivillius. (Firth of Forth.)

This species of the *Lichomolgidæ* somewhat resembles both *Sabelliphilus* and *Herrmannella* in the structure and armature of the fourth pair of feet. It also resembles *Herrmannella* in the form of the anterior antennæ, but it differs from *Sabelliphilus* in the first two joints of the anterior antennæ being cylindrical and not dilated; and it differs from *Herrmannella* in the anterior foot-jaws (the external second-maxillæ) being furnished with only one internal smooth seta on the basal part of the second joint; whereas in *Herrmannella*, there are two setæ on the inner part of the base of the second joint of the anterior foot-jaws, one seta being comparatively short and smooth, and one elongate and denticulate.

Lichomolgus arenicolus, Brady, is evidently not a true member of the genus *Lichomolgus*. In this species both branches of the fourth pair are three-jointed, and their armature is very similar to that of the second and third pairs; but it varies also in other structural details, and to such an extent that it cannot satisfactorily be placed in any of the genera I have referred to. The same may be said of an interesting species discovered some time ago by I. C. Thompson of Liverpool, and described by him under the name of *Lichomolgus maximus*; the species was found living as a mess-mate within the shell of the large scallop, *Pecten maximus*. That this is not a true *Lichomolgus*, according to the definition of the genus I have already referred to, will be at once apparent from the following quotation from Mr Thomson's description of the species. He says :—'The first four pairs of swimming-feet have both branches three-jointed.' . . . . . . 'It agrees with *Lichomolgus agilis*' (= *Herrmannella rostrata*, Canu) 'in having the inner branch of the fourth pair of swimming-feet 'three-jointed.' It is evident from this description, and independent of other structural differences, that *Lichomolgus maximus* is not, any more than *Lichomolgus arenicolus*, a true member of that genus; but the question as to which genus they should be assigned, to secure for them a satisfactory resting-place, is a matter requiring further study. It is quite possible that their structural details may not meet the conditions of any described genus. *Lichomolgus maximus*, however, appears to have a closer affinity with *Modiolicola* Aurivillius, than with any of the other genera referred to here.

Pseudanthessius thorellii (Brady and Robertson).

1875. *Lichomolgus thorellii*, Brady and Robertson (10), p. 197.
1880. *Lichomolgus thorellii*, Brady (8), vol. iii. p. 47, pl. lxxxviii. figs. 1–9.
1893. *Lichomolgus thorellii*, I. C. Thompson (33), p. 33, pl. xxv. fig. 2 *c*.

Habitat.—Off St Monans. Scarce.

This appears to be one of the rarer species of *Lichomolgus*. I find comparatively few records of its occurrence in the British seas. Dr Brady obtained it at one or two places off the Durham and Yorkshire Coasts. Mr I. C. Thompson obtained it at Port Erin, Isle of Man; Moray Firth amongst *Fillograna* (A. S.); these, with the present record of its occurrence in the Forth, are the only British records for this species known to me.

Pseudanthessius sauvagei, Canu.
1891. *Pseudanthessius sauvagei*, Canu (10 *b*.), p. 481.
1892. *Pseudanthessius sauvagei*, Canu (11), p. 243, pl. xxv. figs. 1–17.
1894. *Pseudanthessius sauvagei*, T. and A. Scott (31), p. 146.

Habitat.—Off St Monans. Rare.

Want of time has prevented the preparation of drawings of this interesting species for the present paper.

Pseudanthessius gracilis, Claus.
1889. *Pseudanthessius gracilis*, Claus (13), vol. viii. p. 344, pl. iv. figs. 1--7.
1893. *Pseudanthessius gracilis*, T. and A. Scott (32), p. 241, pl. xii. figs. 15--20.

Habitat.—Off Musselburgh, among material collected in 1891. Some specimens were also taken in the Moray Firth among *Filograna implexa*.

One of the Moray Firth specimens measured 1·3 mm. ($\frac{1}{19}$th of an inch). The anterior antennæ are shorter than the first body segment, and seven-jointed; the third and the last joints are the shortest. The proportional lengths are shown by the formula:—

$$\frac{17 \,.\, 20 \cdot 8 \cdot 14 \cdot 16 \cdot 13 \cdot 9 \cdot}{1 \cdot 2 \,.\, 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot}$$

The third joint of the posterior antennæ is very small. The anterior foot-jaws are slender, and armed with a few strong teeth on the upper edge. A plumose seta springs from the inner edge near the base of the second joint. Posterior foot-jaws three-jointed. Second joint somewhat dilated, and bearing a short stout spine. The last joint very small, and armed with two terminal spines. Inner branches of the fourth pair of thoracic feet one-jointed, scarcely reaching to the end of the second joint of the outer branches, and armed with two dagger-shaped spines at the truncate apex. There is a small hook-like process near the middle of the inner margin. Fifth pair small, sub-quadrate, and furnished at the apex with an elongate dagger-like spine and a plain seta. Caudal stylets equal to about twice the length of the last abdominal segment. A small seta springs from near the middle of the outer margin of each stylet in addition to the terminal setæ.

This species differs from *Pseudanthessius thorellii* (B. and R.), with which it is closely allied, in the form of the anterior foot-jaws in the proportional length of the inner branches of the fourth pair of thoracic feet, and in the form of the abdomen.

Family ASCOMYZONTIDÆ.

Genus *Dermatomyzon*, Claus (1889).

[*Cyclopicera*, Brady (in part)].

Dermatomyzon gibberum, T. and A. Scott. (Pl. X. figs. 26–34.)
1894. *Dermatomyzon gibberum*, T. and A. Scott, p. 144, pl. ix. figs. 10–14.

Description.—Female. Length, ·5 mm. ($\frac{1}{50}$ of an inch). Cephalo-thorax broadly ovate, or pear-shaped. Abdomen very short; its length, including that of the stylets, is scarcely equal to one-fourth of the length of cephalo-thorax. Anterior antennæ stout, seventeen-jointed. The second basal joint appears to be composed of two or three coalesced joints, as shown in the formula, which gives approximately the proportional lengths of the joints :—

$$\frac{40 \cdot (19 \cdot 10 \cdot 7) . 8 \cdot 10 \cdot 12 \cdot 16 \cdot 9 \cdot 9 \cdot 16 \cdot 12 \cdot 12 \cdot 12 \cdot 12 \cdot 16 \cdot 18 \cdot 8 \cdot 26 \cdot}{1 \cdot \quad \cdot 2 \cdot \quad \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12 \cdot 13 \cdot 14 \cdot 15 \cdot 16 \cdot 17 \cdot}$$

Mandibles stylet-shaped, stout, and elongate. The mandible-palp consists of a single oblong joint, the length of which is greater than twice the breadth; and three stout, moderately long and nearly equal setæ spring from its truncate apex. The maxillæ are composed of a sub-triangular primary part, furnished with three apical setæ, and a narrow cylindrical secondary part, provided with four setæ at the apex. The anterior foot-jaws have the basal part stout, but the end is slender and curved, and forms a claw-like appendage. The posterior foot-jaws and swimming-feet are somewhat like those of *Dermatomyzon nigripes* (Brady and Robertson). The fifth pair are simple and two-jointed. The first joint is short, and its breadth is about equal to twice the length, and a seta springs from its upper distal angle. The second joint is longer and narrower, the length being about twice the breadth. It is furnished with two apical setæ. The caudal stylets are nearly as long as broad, and are equal to the combined lengths of the last two abdominal segments.

Habitat.—Vicinity of the Bass Rock. Rare.

The very tumid form of the cephalo-thorax and short abdomen give to this species a very curious and striking appearance that at once distinguishes it from all other Copepods known to us.

Genus *Acontiophorus*, Brady (1880).

Acontiophorus elongatus, T. and A. Scott.
1894. *Acontiophorus elongatus*, T. and A. Scott (31), p. 145, pl. ix. figs. 15–20.

Description.—Female. Length, 1 mm. ($\frac{1}{25}$ of an inch). This is an elongate form. The abdomen is slender, and equal to about two-thirds of the length of the cephalo-thorax. The anterior antennæ are slender, and composed of seventeen joints. The proportional lengths are as follow :—

$$\frac{24 \cdot 12 \cdot 14 \cdot 6 \cdot 6 \cdot 6 \cdot 9 \cdot 6 \cdot 8 \cdot 14 \cdot 12 \cdot 13 \cdot 13 \cdot 14 \cdot 14 \cdot 14 \cdot 24 \cdot}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12 \cdot 13 \cdot 14 \cdot 15 \cdot 16 \cdot 17 \cdot}$$

Posterior antennæ and mouth organs are nearly as in *Acontiophorus scutatus* (Brady and Robertson). The mandibles are extremely long and slender, being about equal in length to the elongate siphon. Foot-jaws and swimming-feet also somewhat similar to those of *Acontiophorus scutatus*, but the fourth pair are armed with remarkably broad and stout dagger-shaped spines on the exterior margins of the outer branches, and broad sabre-like terminal spines on both branches. The fifth pair consists each of a single elliptical joint, furnished with three apical setæ. Caudal stylets very short.

Habitat.—Vicinity of the Rock. Frequent.

Remarks.—The slender form of this species, and especially of its elongate and slender abdomen, enables this species to be distinguished from any other described *Acontiophorus*. It differs from the typical *Acontiophorus scutatus* in the posterior antennæ having only one long and slender spine at the apex instead of two lancet-shaped apical spines, but otherwise the species now described is a true *Acontiophorus*.

II. OSTRACODA.

Family Cytheridæ.

Genus *Cytheropteron*, G. O. Sars.

Cytheropteron humile, Brady and Norman.
1889. *Cytheropteron humile*, Brady and Norman (9), p. 219, pl. xx. figs. 4–7.

Habitat.—Largo Bay, and off Limekilns to the west of Queensferry. Rare.

Two specimens were obtained in a dead cyprina shell dredged in Largo Bay, and a third specimen was obtained in material collected off Limekilns. This interesting species seems to be comparatively rare. It has been taken in the Clyde, in the vicinity of Greenock; and the Marquis de Folin has obtained it in material dredged off Vigo.

III. AMPHIPODA.

Family Lysianassidæ.

Genus *Acidostoma*, Lilljeborg (1865).

Acidostoma obesum (Spence Bate).
1862. *Anonyx obesus*, Sp. Bate (3), p. 74, pl. xii. fig. 1.
1888. *Anonyx obesus*, D. Robertson (26), p. 17.
1890. *Acidostoma obesum*, G. O. Sars (26), p. 38, pl. xiv. fig. 2.

Habitat.—Between Fidra and the Bass Rock. Not common.

Genus *Orchomene*, Boeck (1870).

Orchomene batei, G. O. Sars.
1882. *Orchomene batei*, G. O. Sars (28), i. p. 81.
1862. *Anonyx edwardsi*, Spence Bate (3), p. 73, pl. xi. fig. 5.
1892. *Orchomene batei*, Robertson (27), p. 11.

Habitat.—Vicinity of the Bass Rock. Rather rare.

Genus *Lepidepecreum*, Spence Bate (1868).

Lepidepecreum carinatum, Bate and Westwood.
1868. *Lepidepecreum carinatum*, B. and W. (4), vol. ii. p. 509.
1862. *Anonyx longicornis*, Spence Bate (3), p. 72 (♂).
1888. *Lepidepecreum carinatum* and *Anonyx longicornis*, Robertson (26), p. 91.
1891. *Lepidepecreum carinatum*, G. O. Sars (29), p. 113, pl. xxxix. fig. 1.

Habitat.—Off St Monans and other parts of the Forth. Not common. I have this species also from the Moray Firth.

Family Phoxocephalidæ.

Genus *Harpinia*, Boeck (1876).

Harpinia crenulata, Boeck.
1870. *Harpinia crenulata*, Boeck (7), p. 56.
1891. *Harpinia crenulata*, G. O. Sars (29), p. 158, pl. lv. fig. 2.
1894. *Harpinia crenulata*, T. and A. Scott (31), p. 147.

Habitat.—Vicinity of Inchkeith Island and other parts of the Forth. Not uncommon. The second last pair of pereiopods are comparatively long. The epimeral plates of the last segment of the metasom have the lower distal angle rounded, and provided posteriorly with a single small tooth on either side, or with two or three small teeth of unequal size.

Family AMPELISCIDÆ.

Genus *Haploops*, Lilljeborg (1855).

Haploops tubicola, Lilljeborg.
1855. *Haploops tubicola*, Lilljeborg (21), p. 134.
1868. *Haploops tubicola*, Bate and Westwood (4), vol. ii. p. 505.
1888. *Haploops tubicola*, D. Robertson (26), p. 22.
1891. *Haploops tubicola*, G. O. Sars (29), p. 192, pl. lxvii.

Habitat.—Vicinity of the Bass Rock (1892), and in other parts of the Forth area. Though not recorded till now, this species has been in my possession for a considerable time. The Forth specimens are comparatively small. Another species of the Ampeliscidæ, *Byblis gaimardii*, Kröyer, has been, on the authority of Metzger,* recorded from the vicinity of St Abb's Head, at the mouth of the Firth of Forth (*see* Leslie and Herdman's 'Invertebrate Fauna of the Firth of Forth,' p. 105 (Appendix), and 'Revised List of Crustacea of the Firth of Forth,' by the author); but G. O. Sars, in his new work on 'The Crustacea of Norway,' does not include the British Islands in his notes on the distribution of the species. It is, perhaps, therefore right to state that I am able to corroborate Metzger's record from having been fortunate in capturing a fine specimen of *Byblis gaimardii*, Kröyer, near the May Island, in January 1890. Had there been time a description with drawings of the species would have been prepared for the present Report, but this may be done later.

Family AMPHILOCHIDÆ.

Genus *Amphilochoides*, G. O. Sars (1892).

Amphilochoides pusillus, G. O. Sars.
1892. *Amphilochoides pusillus*, G. O. Sars (29), p. 222, pl. lxxvi. fig. 1.
1894. *Amphilochoides pusillus*, T. and A. Scott (31), p. 147.

Habitat.—Vicinity of the Bass Rock. Not common. This species has no tooth at the base of the dactylus of the first pair of gnathopods, and the palm of the second pair of gnathopods is finely serrate only on the distal half; the other half is even, or nearly so, and bears a few minute setæ.

Family STENOTHOIDÆ.

Genus *Metopa*, Boeck (1870).

Metopa propinqua, G. O. Sars.
1892. *Metopa propinqua*, G. O. Sars (29), p. 264, pl. xciii. fig. 1.

Habitat.—Off Crail, 1892. Rare.

The telson of this species is furnished with three strong denticles on each side of the upper surface and near to the margin. The second gnathopods are also moderately stout. The Forth specimen agrees with Sars' description of the species in all its principal characters. Several of the species of *Metopa* are very small and troublesome to diagnose.

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* Crustacea u. Mollusca v. d. Nordseefahrt d. 'Pomerania,' 1872. (Berlin, 1875.)

Family LEUCOTHOIDÆ.

Genus *Leucothoë*, Leach (1814).

Leucothoë lilljeborgii, Boeck, 1860.
1860. *Leucothoë lilljeborgii*, Boeck, Forhandl. Skand. Naturf. 8 de Mode.
1888. *Leucothoë furina*, Chevreux (non furina Savigny) (12), p. 9.
1889. *Leucothoë imparicornis*, Norman (24), p. 114, pl. x. figs. 1–4.
1892. *Leucothoë incisa*, Robertson (27), p. 23.

Habitat.—Vicinity of the Bass Rock. Rare. This species is readily recognised by the form of the last pair of epimeral plates of the metasome.

Family PARAMPHITHOIDÆ.

Genus *Paramphithoë*, Bruzelius (1859).

Paramphithoë monocuspis, G. O. Sars.
1893. *Paramphithoë monocuspis*, G. O. Sars (29), p. 351, pl. cxxiii. fig. 2.

I record this species for the Firth of Forth on the authority of Dr A. M. Norman. It was sent to him by Dr Henderson in 1884. Some time ago, when looking over a number of Forth Amphipoda, I observed one of the specimens with a single dorsal cusp, which, on further examination, was found to resemble this species fairly well: it was, however, laid aside for further study.

Paramphithoë assimilis, G. O. Sars.
1882. *Paramphithoë assimilis*, G. O. Sars (28), p. 99, pl. v. fig. 1.
1888. *Paramphithoë assimilis*, D. Robertson (26), p. 94.
1893. *Paramphithoë assimilis*, G. O. Sars (29), p. 352, pl. cxxiv. fig. 1.

Habitat.—Found adhering to some zoophytes dredged between the Island of Inchkeith and the May. The Forth specimens belong to *Paramphithoë assimilis*, G. O. Sars, as described in 'Crustacea of Norway,' and not to *Pleustis glaber*, Boeck (*Parapleustis glaber* in 'Crustacea of 'Norway,' p. 358).

Family IPHIMEDIDÆ.

Genus *Iphimedia*, Rathke (1843).

Iphimedia minuta, G. O. Sars.
1882. *Iphimedia minuta*, G. O. Sars (28), p. 100, pl. v. fig. 2.
1892. *Iphimedia minuta*, D. Robertson (27), p. 23.
1893. *Iphimedia minuta*, G. O. Sars (29), p. 379, pl. cxxxiii. fig. 1.

Habitat.—North end of Inchkeith, and in other parts of the Forth. This species has been known to me for a considerable time as quite distinct from *Iphimedia obesa*. Though not a common species it has been obtained at several places within the estuary.

Family ATYLIDÆ.

Genus *Apherusa*.

Apherusa borealis (Boeck).
1893. *Apherusa borealis*, G. O. Sars (29), p. 441, pl. cxv. fig. 2.

Habitat.—In various places within the Forth area, between the Island of Inchkeith and the May, as well as outside of the May Island. Sometimes frequent in the tow-net collections. The two dorsal cusps appear to be stronger in the male than in the female. The telson is of the form of narrow triangular plate with a pointed extremity, and furnished with a minute hair on each side of the apex.

ANNELIDA.

Family NEMERTIDÆ.

Genus *Cerebratulus.*

Cerebratulus angulatus (O. F. Müller).

1853. *Gordius fragilis*, Sir John Dalyell (15), vol. ii. p. 55, pls. vi., vii., vii*.
1874. *Cerebratulus angulatus*, W. C. M'Intosh (22), p. 175.
1894. *Cerebratulus angulatus*, T. Scott, Ann. and Mag. Scot. Nat. Hist., Part 10, p. 118.

A specimen of *Cerebratulus angulatus*, measuring about 14 inches in length, was obtained among some trawl refuse from Largo Bay (off the Wemyss). I cannot find any previous record of *Cerebratulus* having been taken in the Forth. Harry Goodsir and Sir John Dalzell publish records of this species for Scotland, but do not give the localities.

MOLLUSCA.

CONCHIFERA.

Family PANDORIDÆ.

Genus *Lyonsia*, Turton.

Lyonsia norvegica (Chemnitz).

1865. *Lyonsia norvegica*, J. G. Jeffreys (19), vol. iii. p. 29 (vol. v. p. 190, pl. xlviii. fig. 2.)

Habitat.—Vicinity of the Bass Rock; depth of water 22–23 fathoms. Bottom, sandy mud. A living specimen of this mollusc was taken a short distance north-east of the Bass Rock on 30th October 1893. There does not appear to have been hitherto any very satisfactory record of the occurrence of *Lyonsia* in the Firth of Forth. There is no record of its occurrence in the Forth, either by the Rev. W. Wood (East Neuk of Fife), or by Leslie and Herdman (Invertebrate Fauna of the Firth of Forth). Dr Henderson, in his notes on the Forth Invertebrates, in the Proceedings of the Royal Physical Society of Edinburgh (1883–84), records the discovery of 'a single broken valve at Newhaven'; but he states distinctly that 'in all cases where "Newhaven" is given as the locality, it must be 'understood that the specimens are from the fishermen's lines, and probably 'taken to the east of the May Island.' The present is therefore the only satisfactory record I know of for *Lyonsia norvegica* as a member of the Forth fauna.

The following is a list of some of the works more particularly referred to in this contribution towards a Natural History of the Firth of Forth :—

1. 1883. AURIVILLIUS, C. W. S., *Bidrag till Kännedomen om Krustaceer, som lefva hos Mollusker och Tunikater; Akademisk Afhandling.*

2. 1850. Baird, W., 'Natural History of British Entomostraca'; Ray Society.

3. 1862. Bate, C. S., *Catalogue of Amphipodous Crustacea in the British Museum.*

4. 1863–68. Bate, C. S., and Westwood, *A History of the British Sessile-eyed Crustacea*, vol. i. 1863, vol. ii. 1868.

5. 1864. Boeck, A., 'Oversigt over de ved Norges Kyster jaggtagne Copepoder henhorende til *Calanidernes,' Cyclopidernes Familier;* Forhandl. i. Vidensk, Selskab i. Christiania.

6. 1872. Boeck, A., *Nye Slaegter og Arter of Saltvands Copepoder;* Forhandl. i. Vidensk, Selskab i. Christiania.

7. 1870. Boeck, A., *Crustacea Amphipoda borealis et Arctic*, Christiania.

7*a*. 1872. Brady, *Nat. Hist. Trans.*, Northumberland and Durham, vol. iv.

8. 1878–80. Brady, G. S., 'A Monograph of the Free and Semi-parasitic Copepoda of the British Islands,' Ray Society. Vol. i. 1878.

9. 1889. Brady and Norman, 'Monograph of the Marine and Fresh Water Ostracoda of the North Atlantic and North-western Europe.'

10. 1875. Brady and Robertson, 'Report on Dredging off the Coast of Durham and North Yorkshire in 1874.' In Rep. 45. Meet. British Ass., Adv. Ser.

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DESCRIPTION OF THE PLATES.

Plate V.

Pseudocyclopia caudata, sp. nov.

Fig. 1.	Female, lateral view,	× 32 diameters.
Fig. 2.	Anterior antenna of the same,	× 456 ,,
Fig. 3.	Foot of first pair,	× 456 ,,
Fig. 4.	Foot of second pair,	× 190 ,,
Fig. 5.	Foot of third pair,	× 168 ,,
Fig. 6.	Foot of fourth pair,	× 338 ,,
Fig. 7.	Fifth pair of feet,	× 570 ,,
Fig. 8.	Abdomen and caudal stylets,	× 95 ,,

Cyclopina elegans, sp. nov.

Fig. 9.	Female, dorsal view,	× 54 diameters
Fig. 10.	Anterior antenna—female,	× 300 ,,
Fig. 11.	Anterior antenna—male	× 300 ,,
Fig. 12.	Posterior antenna,	× 338 ,,
Fig. 13.	Mandible and palp,	× 253 ,,
Fig. 14.	Maxilla,	× 253 ,,
Fig. 15.	Anterior foot-jaw,	× 253 ,,
Fig. 16.	Posterior foot-jaw,	× 500 ,,
Fig. 17.	Foot of first pair,	× 300 ,,
Fig. 18.	Foot of fourth pair,	× 200 ,,
Fig. 19.	Foot of fifth pair,	× 380 ,,

Ameira reflexa, sp. nov.

Fig. 20.	Female, lateral view,	× 106 diameters.
Fig. 21.	Anterior antenna of the same,	× 500 ,,
Fig. 22.	Posterior antenna,	× 500 ,,
Fig. 23.	Mandible and palp,	× 500 ,,
Fig. 24.	Posterior foot-jaw,	× 760 ,,
Fig. 25.	Foot of first pair,	× 253 ,,
Fig. 26.	Foot of fourth pair,	× 135 ,,
Fig. 27.	Foot of fifth pair,	× 253 ,,
Fig. 28.	Part of abdomen and caudal stylets,	× 228 ,,

Ameira longiremis, sp. nov.

Fig. 29.	Posterior antenna,	× 380 diameters.
Fig. 30.	Posterior foot-jaw,	× 456 ,,
Fig. 31.	Foot of fifth pair,	× 380 ,,
Fig. 32.	Caudal stylets,	× 152 ,,

PLATE VI.

Ameira longiremis, sp. nov.

Fig. 1.	Female, lateral view,	× 96 diameters.
Fig. 2.	Anterior antenna of the same,	× 456 ,,
Fig. 3.	Mandible and palp,	× 380 ,,
Fig. 4.	Foot of first pair,	× 380 ,,
Fig. 5.	Foot of fourth pair,	× 380 ,,

Ameira longiremis, var. *intermedia*.

Fig. 6.	Female, lateral view,	× 53 diameters.
Fig. 7.	Anterior antenna of the same,	× 456 ,,
Fig. 8.	Posterior antenna,	× 380 ,,
Fig. 9.	Mandible and palp,	× 456 ,,
Fig. 10.	Posterior foot-jaw,	× 500 ,,
Fig. 11.	Foot of first pair,	× 380 ,,
Fig. 12.	Foot of fourth pair,	× 190 ,,
Fig. 13.	Foot of fifth pair,	× 380 ,,
Fig. 14.	Abdomen and caudal stylets,	× 190 ,,

Ameira exigua, sp. nov.

Fig. 15.	Female lateral view,	× 106 diameters.
Fig. 16.	Anterior antenna of the same,	× 500 ,,
Fig. 17.	Posterior antenna,	× 500 ,,
Fig. 18.	Mandible and palp,	× 500 ,,
Fig. 19.	Posterior foot-jaw,	× 760 ,,
Fig. 20.	Foot of first pair,	× 380 ,,
Fig. 21.	Foot of fourth pair,	× 380 ,,
Fig. 22.	Foot of fifth pair,	× 456 ,,
Fig. 23.	Abdomen and caudal stylets,	× 127 ,,

Laophonte depressa, sp. nov.

Fig. 24.	Female, dorsal view,	× 54 diameters.
Fig. 25.	Mandible and palp,	× 380 ,,
Fig. 26.	Posterior foot-jaw,	× 254 ,,
Fig. 27.	Foot of first pair,	× 168 ,,
Fig. 28.	Foot of fourth pair,	× 126 ,,
Fig. 29.	Foot of third pair—male,	× 190 ,,
Fig. 30.	Foot of fifth pair—female,	× 254 ,,
Fig. 31.	Foot of fifth pair—male (*a*. appendage to first abdominal segment),	× 380 ,,

PLATE VII.

Laophonte depressa, sp. nov.

Fig. 1.	Anterior antenna of female,	× 254 diameters.
Fig. 2.	Anterior antenna of male,	× 254 ,,
Fig. 3.	Posterior antenna,	× 254 ,,

Tetragoniceps consimilis, sp. nov.

Fig. 4.	Female, lateral view,	× 106 diameters.
Fig. 5.	Anterior antenna of the same,	× 254 ,,
Fig. 6.	Postrerior antenna,	× 500 ,,
Fig. 7.	Mandible and palp,	× 380 ,,
Fig. 8.	Posterior foot-jaw,	× 500 ,,
Fig. 9.	Foot of first pair,	× 380 ,,
Fig. 10.	Foot of fourth pair,	× 380 ,,
Fig. 11.	Foot of fifth pair,	× 152 ,,
Fig. 12.	Abdomen and caudal stylets,	× 190 ,,

Laophonte denticornis, sp. nov.

Fig. 13.	Female, dorsal view,	× 80 diameters.
Fig. 14.	Anterior antenna—female,	× 338 ,,
Fig. 15.	Anterior antenna—male,	× 338 ,,
Fig. 16.	Posterior antenna,	× 338 ,,
Fig. 17.	Mandible and palp,	× 500 ,,
Fig. 18.	Posterior foot-jaw,	× 380 ,,
Fig. 19.	Foot of first pair,	× 338 ,,
Fig. 20.	Foot of fourth pair,	× 380 ,,
Fig. 21.	Foot of third pair—male,	× 250 ,,
Fig. 22.	Foot of fifth pair—female,	× 250 ,,
Fig. 23.	Foot of fifth pair—male (*a*. appendage to first abdominal segiment),	× 380 ,,

Laophonte simulans, sp. nov.

Fig. 24.	Female, dorsal view,	× 106 diameters.
Fig. 25.	Posterior antenna,	× 380 ,,
Fig. 26.	Mandible and palp,	× 380 ,,
Fig. 27.	Posterior foot-jaw,	× 380 ,,
Fig. 28.	Foot of first pair,	× 380 ,,
Fig. 29.	Foot of third pair,	× 380 ,,
Fig. 30.	Foot of fourth pair,	× 500 ,,
Fig. 31.	Foot of fifth pair,	× 380 ,,
Fig. 32.	Abdomen and caudal stylets,	× 190 ,,

PLATE VIII.

Laophonte simulans, sp. nov.

Fig. 1.	Anterior antenna—female,	× 380 diameters.

Laophontodes typicus, gen. et sp. nov.

Fig. 2.	Female, dorsal view,	× 190 diameters.
Fig. 3.	Anterior antenna of the same,	× 500 ,,
Fig. 4.	Posterior antenna,	× 500 ,,
Fig. 5.	Posterior foot-jaw,	× 500 ,,
Fig. 6.	Foot of first pair,	× 500 ,,
Fig. 7.	Foot of fourth pair,	× 500 ,,
Fig. 8.	Foot of fifth pair,	× 500 ,,

Pontopolites typicus, gen. et sp. nov.

Fig. 9.	Female, lateral view,	× 106 diameters.
Fig. 10.	Anterior antenna of the same,	× 380 ,,
Fig. 11.	Posterior antenna,	× 380 ,,
Fig. 12.	Mandible and palp,	× 760 ,,
Fig. 13.	Posterior foot-jaw,	× 760 ,,
Fig. 14.	Foot of first pair,	× 380 ,,
Fig. 15.	Foot of fourth pair,	× 380 ,,
Fig. 16.	Foot of fifth pair,	× 380 ,,
Fig. 17.	Abdomen and caudal stylets,	× 127 ,,

Cletodes curvirostris, sp. nov.

Fig. 18.	Female, lateral view,	× 70 diameters.
Fig. 19.	Anterior antenna of the same,	× 380 ,,
Fig. 20.	Posterior antenna,	× 380 ,,
Fig. 21.	Mandible and palp,	× 500 ,,
Fig. 22.	Posterior foot-jaw,	× 760 ,,
Fig. 23.	Foot of first pair,	× 380 ,,
Fig. 24.	Foot of fourth pair,	× 380 ,,
Fig. 25.	Foot of fifth pair,	× 380 ,,
Fig. 26.	Abdomen and caudal stylets,	× 106 ,,

Heteropsyllus curticaudatus, gen. et sp. nov.

Fig. 27.	Female, lateral view,	× 160 diameters.
Fig. 28.	Anterior antenna of the same,	× 380 ,,
Fig. 29.	Posterior antenna,	× 760 ,,
Fig. 30.	Mandible and palp,	× 760 ,,
Fig. 31.	Posterior foot-jaw,	× 760 ,,
Fig. 32.	Foot of first pair,	× 380 ,,
Fig. 33.	Foot of fourth pair,	× 300 ,,
Fig. 34.	Abdomen and caudal stylets,	× 190 ,,

PLATE IX.

Heteropsyllus curticaudatus, gen. et sp. nov.

Fig. 1.	Foot of fifth pair,	× 380 diameters.

Leptopsyllus typicus, gen. et sp. nov.

Fig. 2.	Female, dorsal view,	× 106 diameters.
Fig. 3.	Anterior antenna of the same,	× 500 ,,
Fig. 4.	Posterior antenna,	× 500 ,,
Fig. 5.	Mandible and palp,	× 760 ,,
Fig. 6.	Anterior foot-jaw,	× 760 ,,
Fig. 7.	Posterior foot-jaw,	× 760 ,,
Fig. 8.	Foot of first pair,	× 760 ,,
Fig. 9.	Foot of third pair,	× 760 ,,
Fig. 10.	Foot of fourth pair,	× 760 ,,
Fig. 11.	Foot of fifth pair,	× 760 ,,

Dactylopus coronatus, sp. n.

Fig. 12.	Female, dorsal view,	× 80 diameters.
Fig. 13.	Anterior antenna of the same,	× 380 ,,
Fig. 14.	Posterior antenna,	× 253 ,,
Fig. 15.	Mandible and palp,	× 253 ,,
Fig. 16.	Posterior foot-jaw,	× 380 ,,
Fig. 17.	Foot of first pair,	× 253 ,,
Fig. 18.	Foot of fourth pair,	× 190 ,,
Fig. 19.	Foot of fifth pair,	× 380 ,,
Fig. 20.	Abdomen and caudal stylets,	× 126 ,,

Pseudowestwoodia andrewi, gen. et sp. nov.

Fig. 21.	Female, lateral view,	× 106 diameters.
Fig. 22.	Anterior antenna of the same,	× 500 ,,
Fig. 23.	Posterior antenna,	× 500 ,,
Fig. 24.	Mandible and palp,	× 500 ,,
Fig. 25.	Posterior foot-jaw,	× 760 ,,
Fig. 26.	Foot of first pair,	× 500 ,,
Fig. 27.	Foot of fourth pair,	× 380 ,,
Fig. 28.	Foot of fifth pair,	× 760 ,,
Fig. 29.	Abdomen and caudal stylets,	× 380 ,,

Ameira exilis, T. and A. Scott.

Fig. 30.	Male spermatophore,	× 160 diameters.

PLATE X.

Ameira exilis, T. and A. Scott.

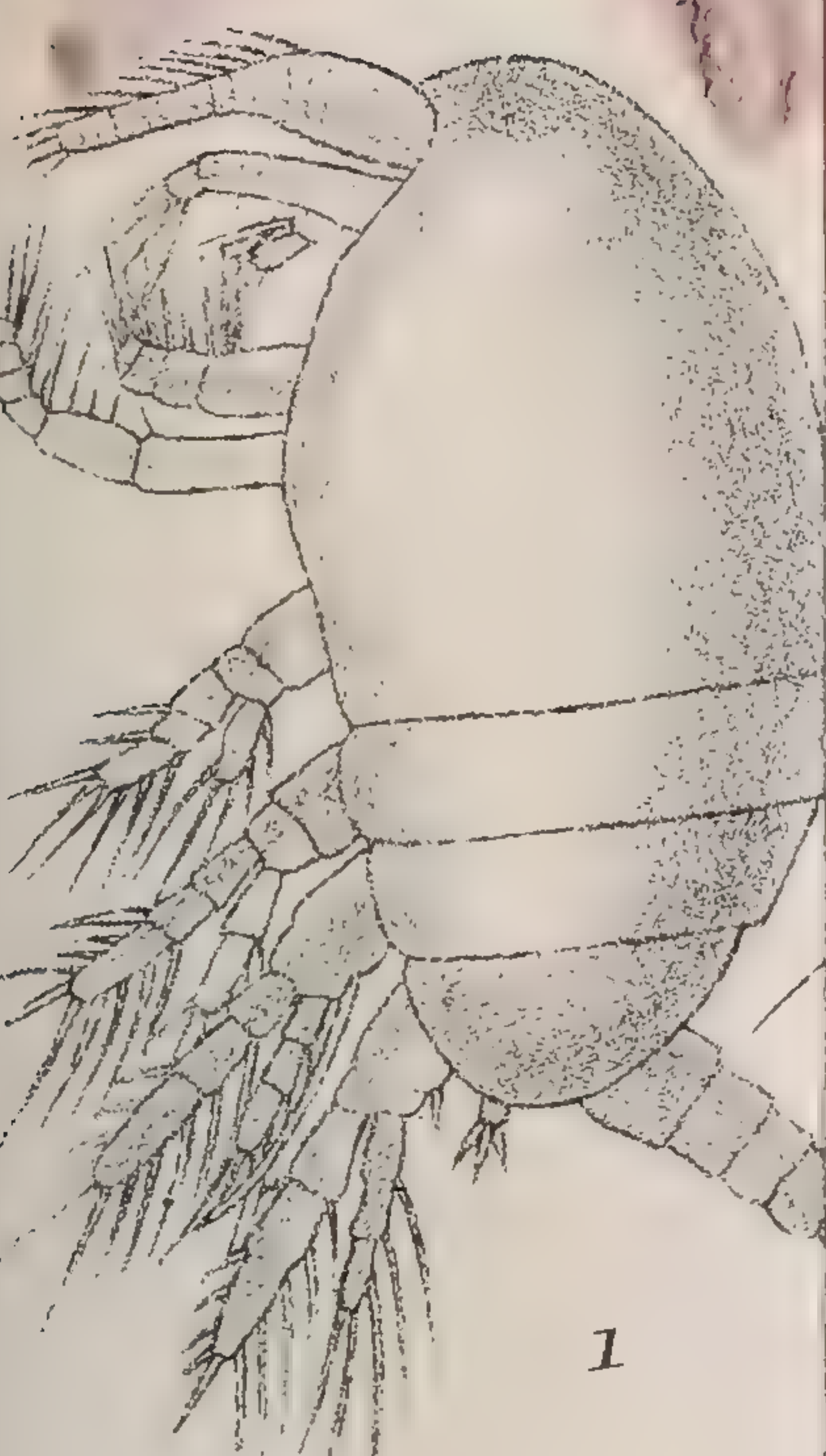
Fig. 1.	Female, lateral view,	× 53 diameters.
Fig. 2.	Anterior antenna—female,	× 168 ,,
Fig. 3.	Anterior antenna—male,	× 190 ,,
Fig. 4.	Posterior antenna,	× 254 ,,
Fig. 5.	Mandible and palp,	× 500 ,,
Fig. 6.	Posterior foot-jaw,	× 500 ,,
Fig. 7.	Foot of first pair,	× 190 ,,
Fig. 8.	Foot of fourth pair,	× 126 ,,
Fig. 9.	Foot of third pair—male,	× 126 ,,
Fig. 10.	Foot of fifth pair—female,	× 190 ,,
Fig. 11.	Foot of fifth pair—male (*a*. appendage to first abdominal segment),	× 190 ,,
Fig. 12.	Abdomen and caudal stylets,	× 80 ,,

Thalestris forficuloides, T. and A. Scott.

Fig. 13.	Female, lateral view,	× 80 diameters.
Fig. 14.	Anterior antenna—female,	× 254 ,,
Fig. 15.	Anterior antenna—male,	× 254 ,,
Fig. 16.	Posterior antenna,	× 500 ,,
Fig. 17.	Mandible and palp,	× 500 ,,
Fig. 18.	Maxilla,	× 380 ,,
Fig. 19.	Posterior foot-jaw,	× 500 ,,
Fig. 20.	Foot of first pair,	× 254 ,,
Fig. 21.	Foot of fourth pair,	× 190 ,,
Fig. 22.	Foot of third pair—male,	× 190 ,,
Fig. 23.	Foot of fifth pair—female,	× 127 ,,
Fig. 24.	Foot of fifth pair—male,	× 254 ,,
Fig. 25.	Abdomen and caudal stylets,	× 80 ,,

Dermatomyzon gibberum, T. and A. Scott.

Fig. 26.	Female, dorsal view,	× 106 diameters.
Fig. 27.	Anterior antenna of the same,	× 334 ,,
Fig. 28.	Mandible and palp,	× 456 ,,
Fig. 29.	Maxilla,	× 456 ,,
Fig. 30.	Anterior foot-jaw,	× 254 ,,
Fig. 31.	Posterior foot-jaw,	× 380 ,,
Fig. 32.	Foot of first pair,	× 254 ,,
Fig. 33.	Foot of fourth pair,	× 254 ,,
Fig. 34.	Foot of fifth pair,	× 760 ,,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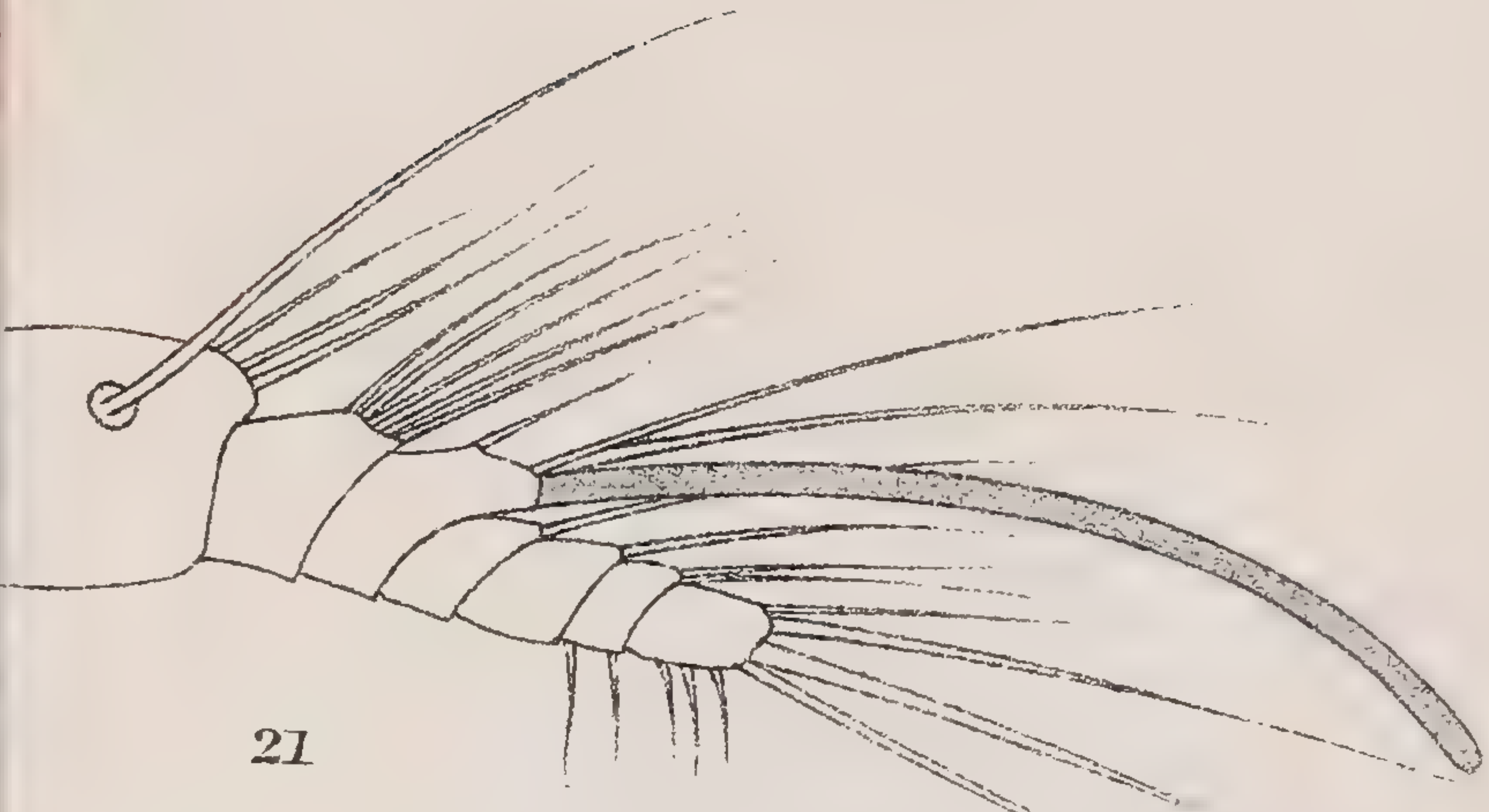
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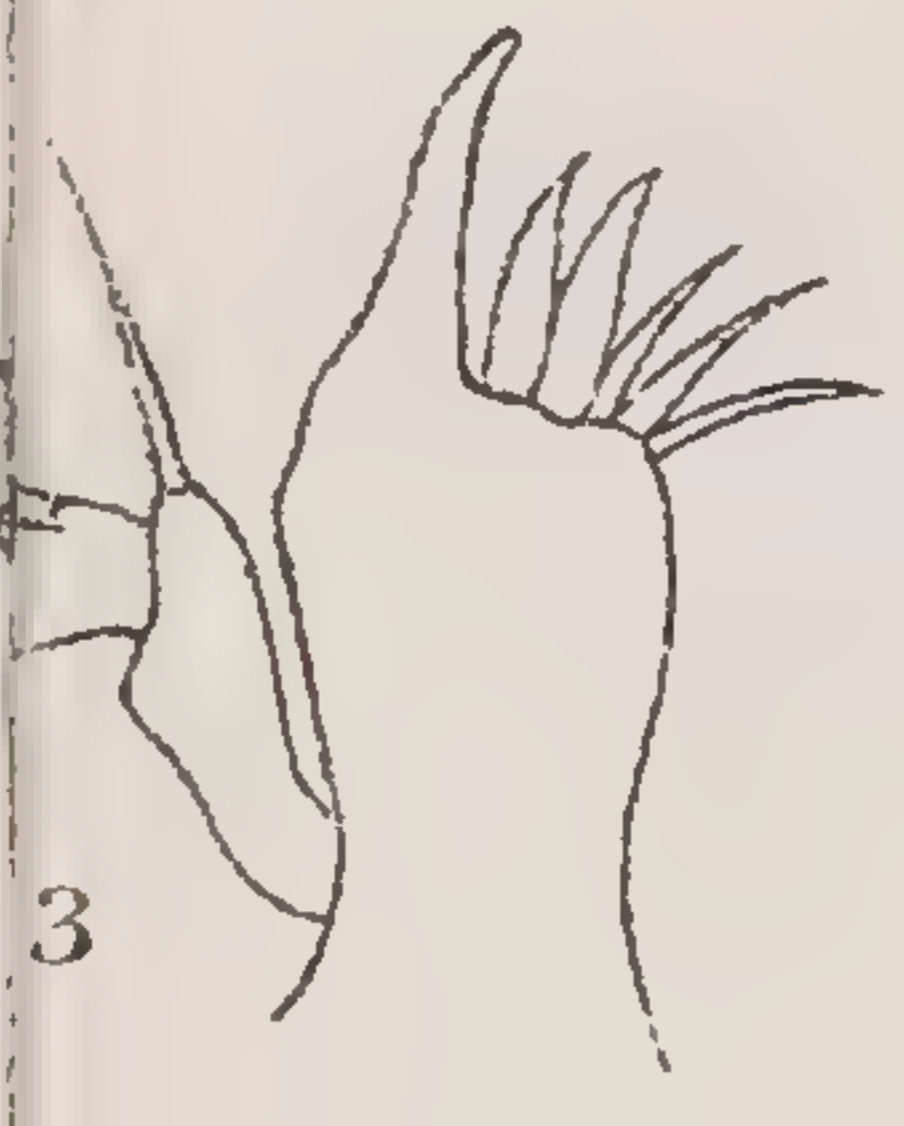
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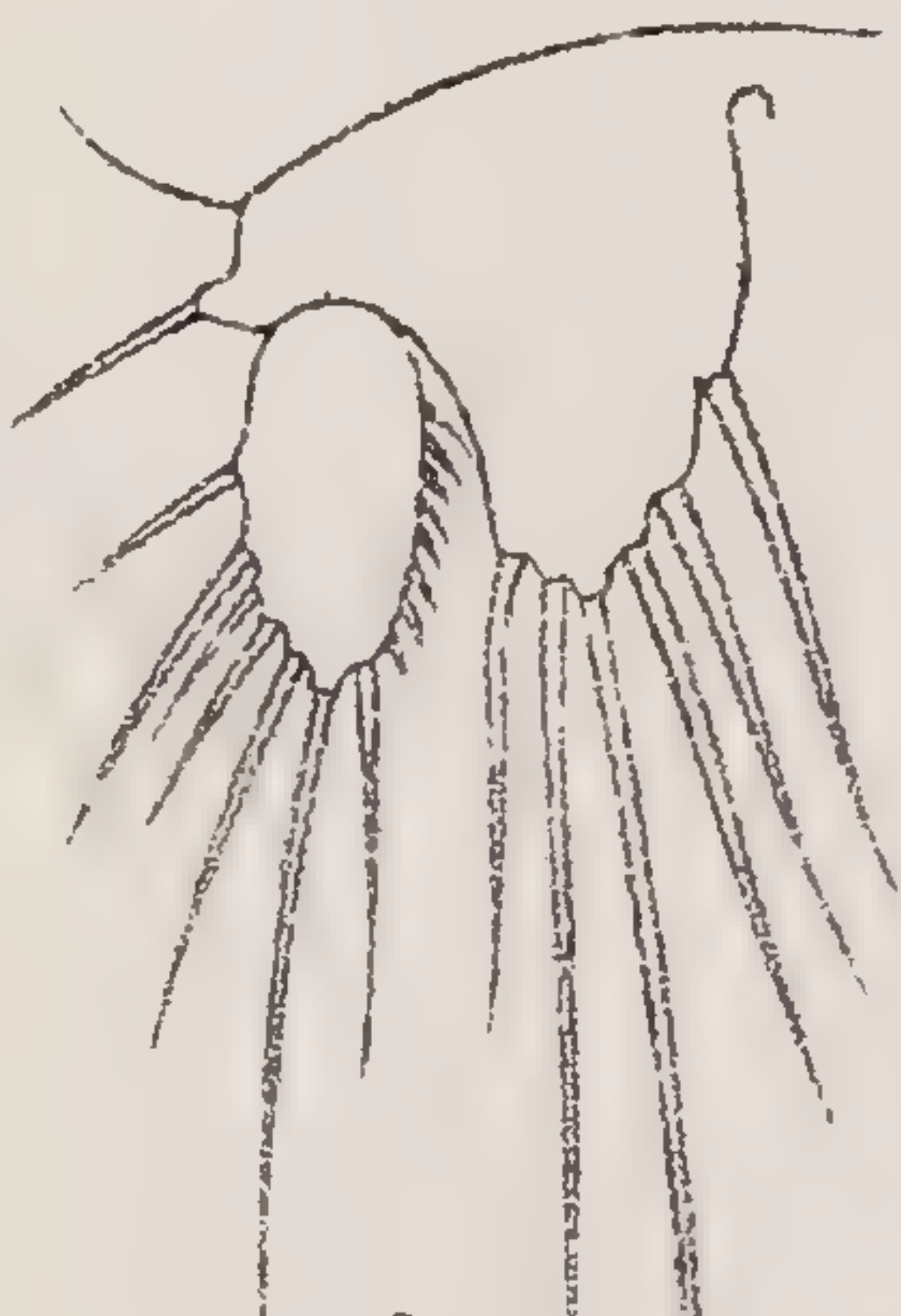
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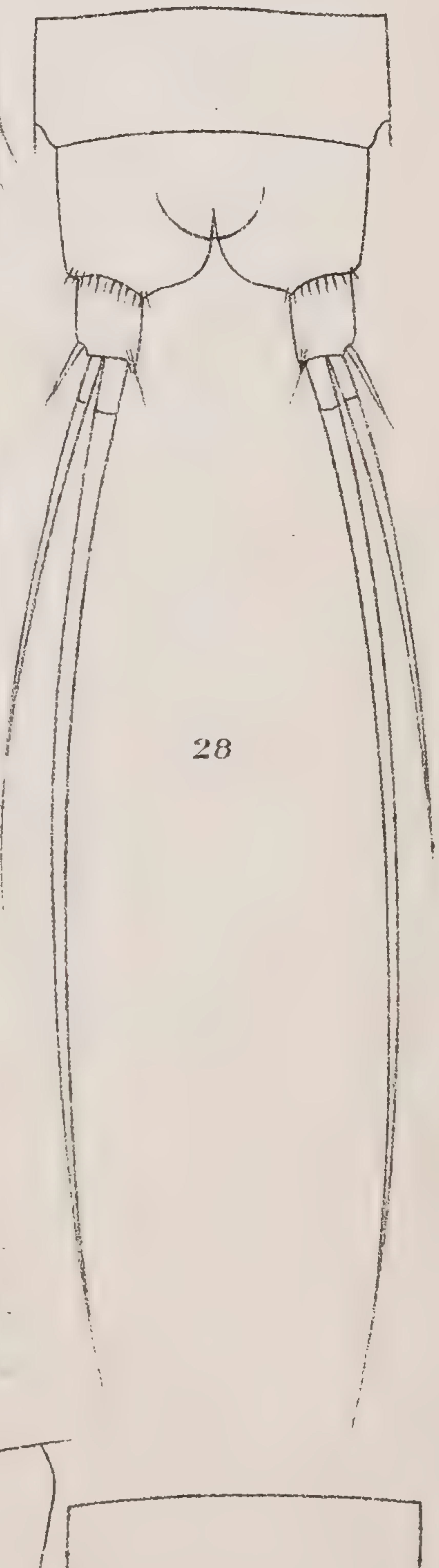
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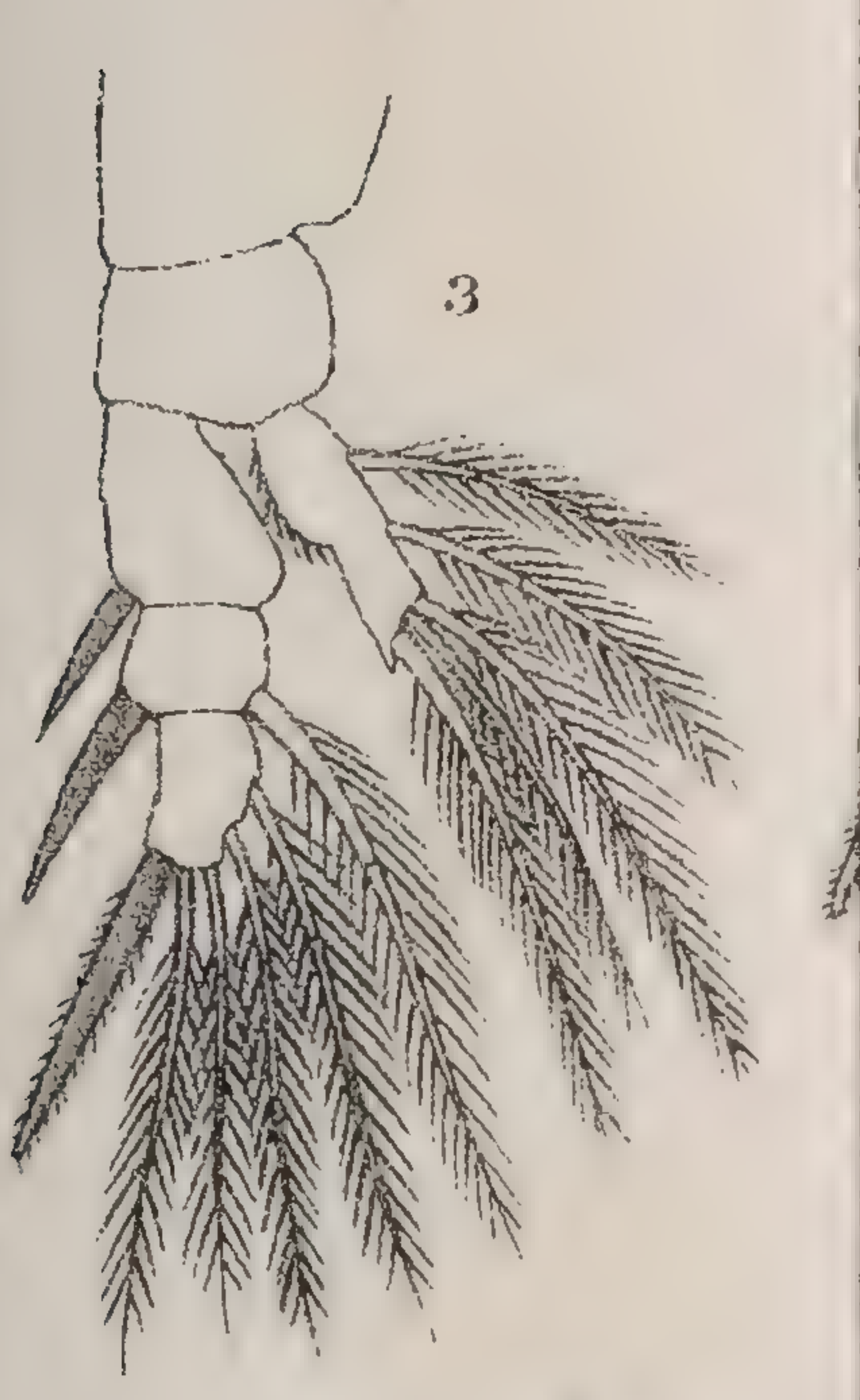
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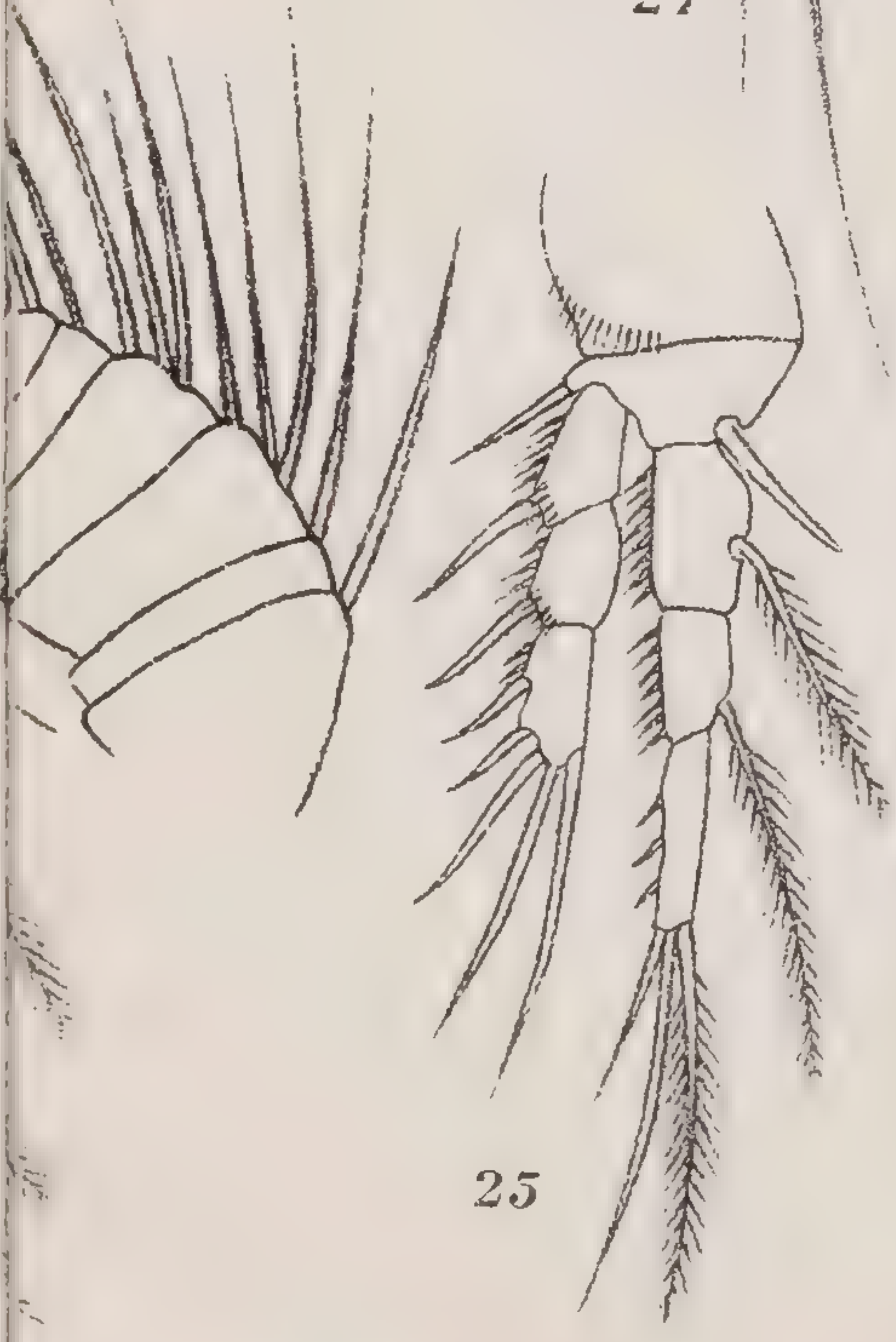
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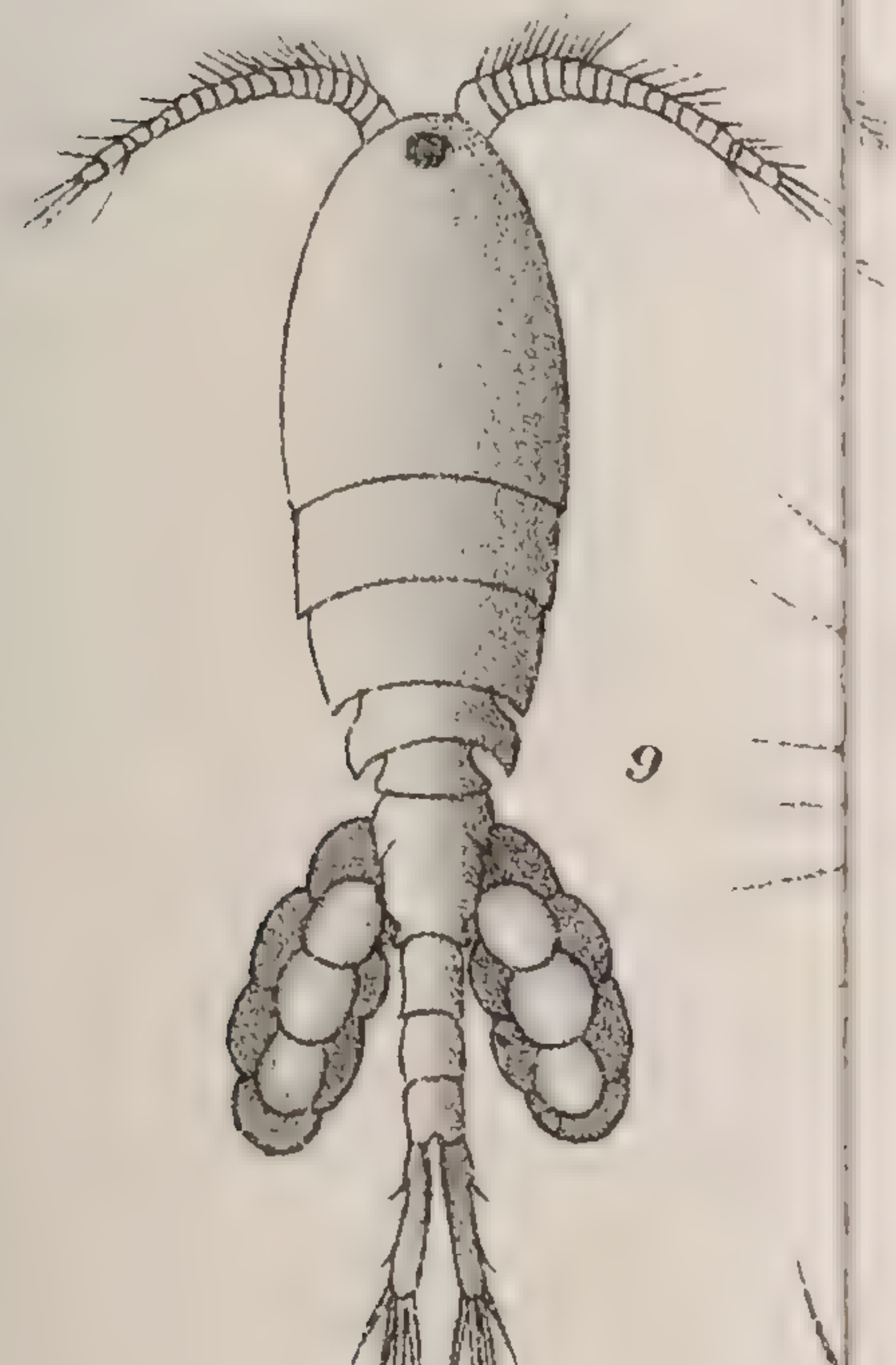
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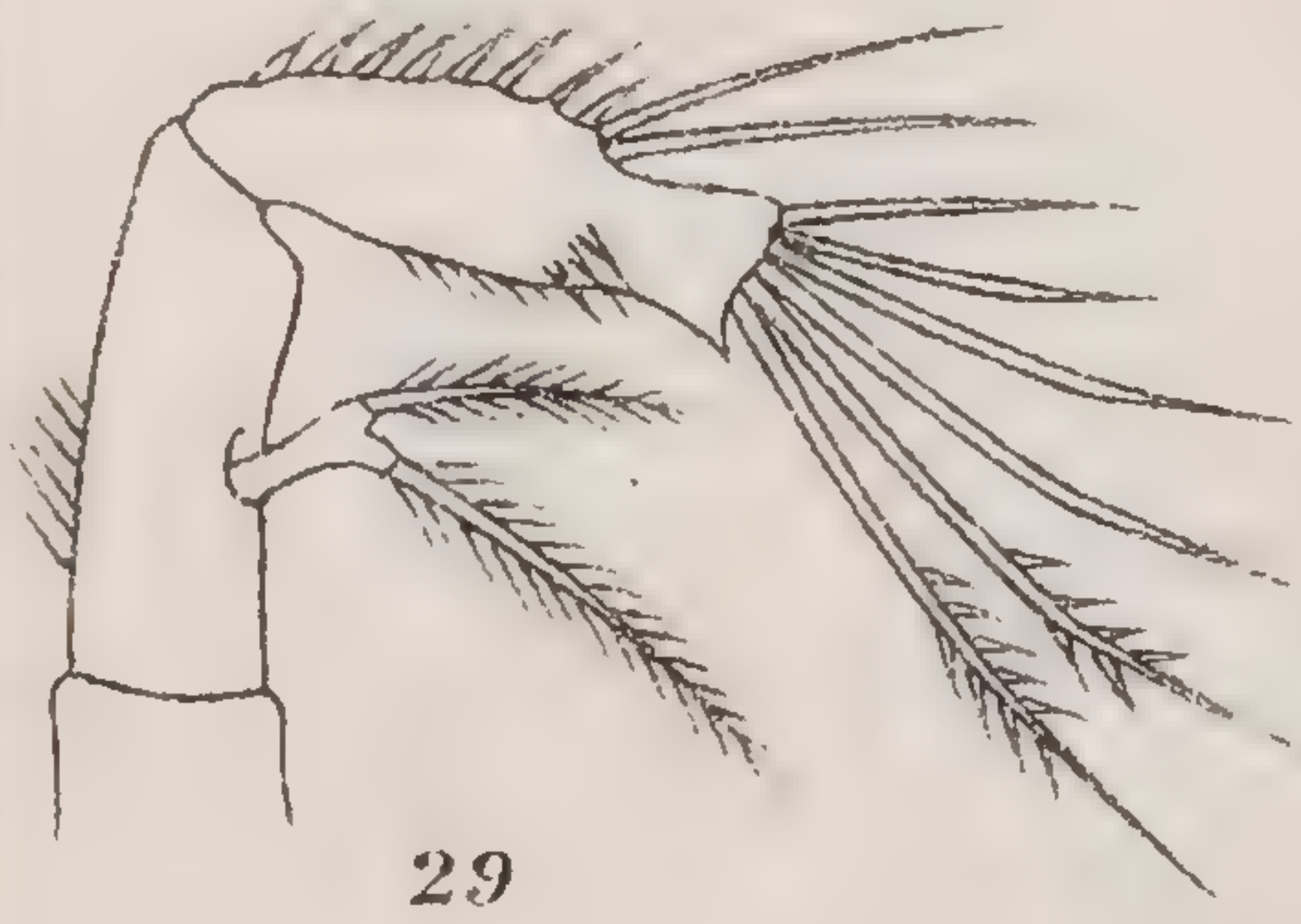
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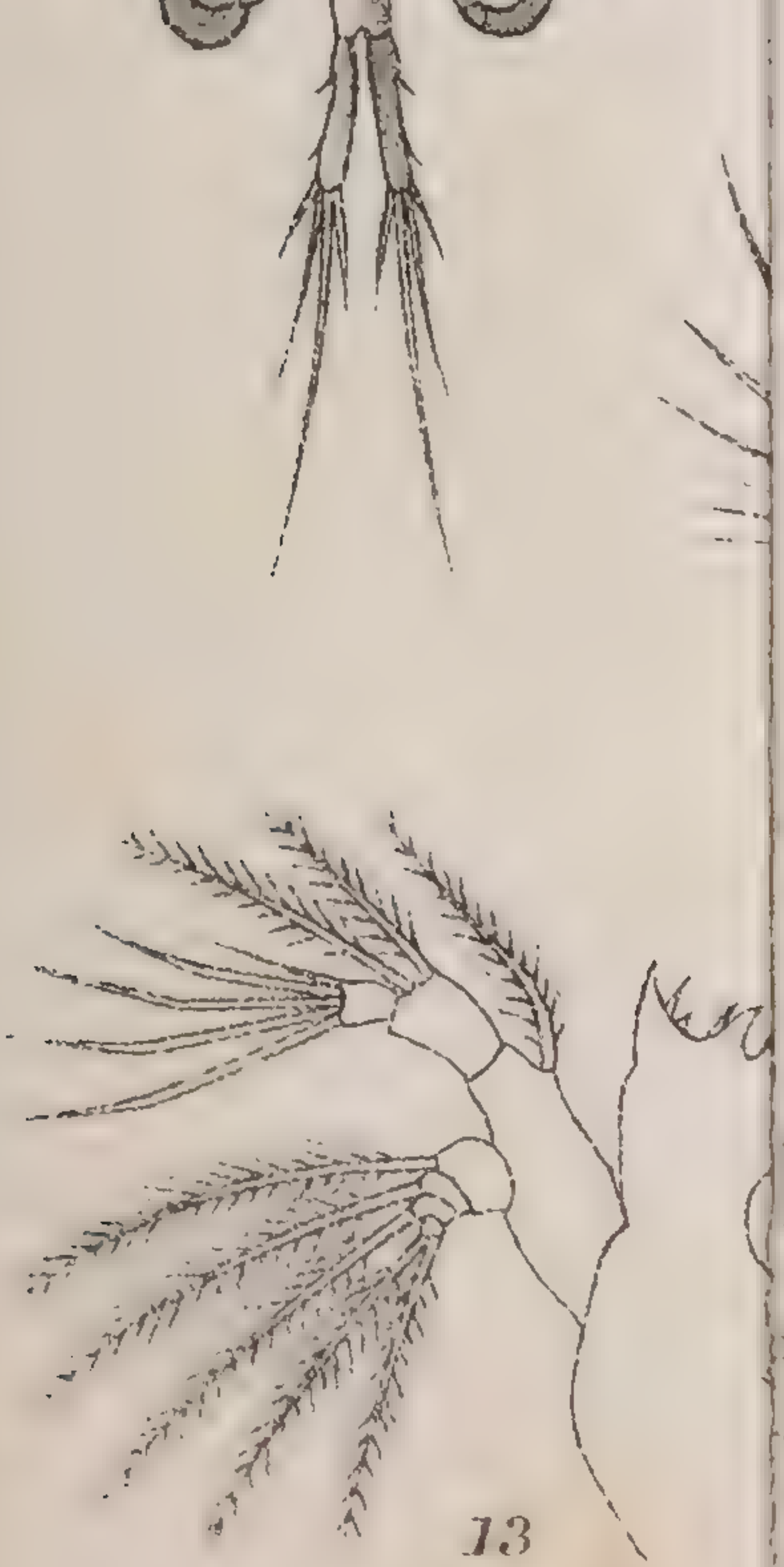
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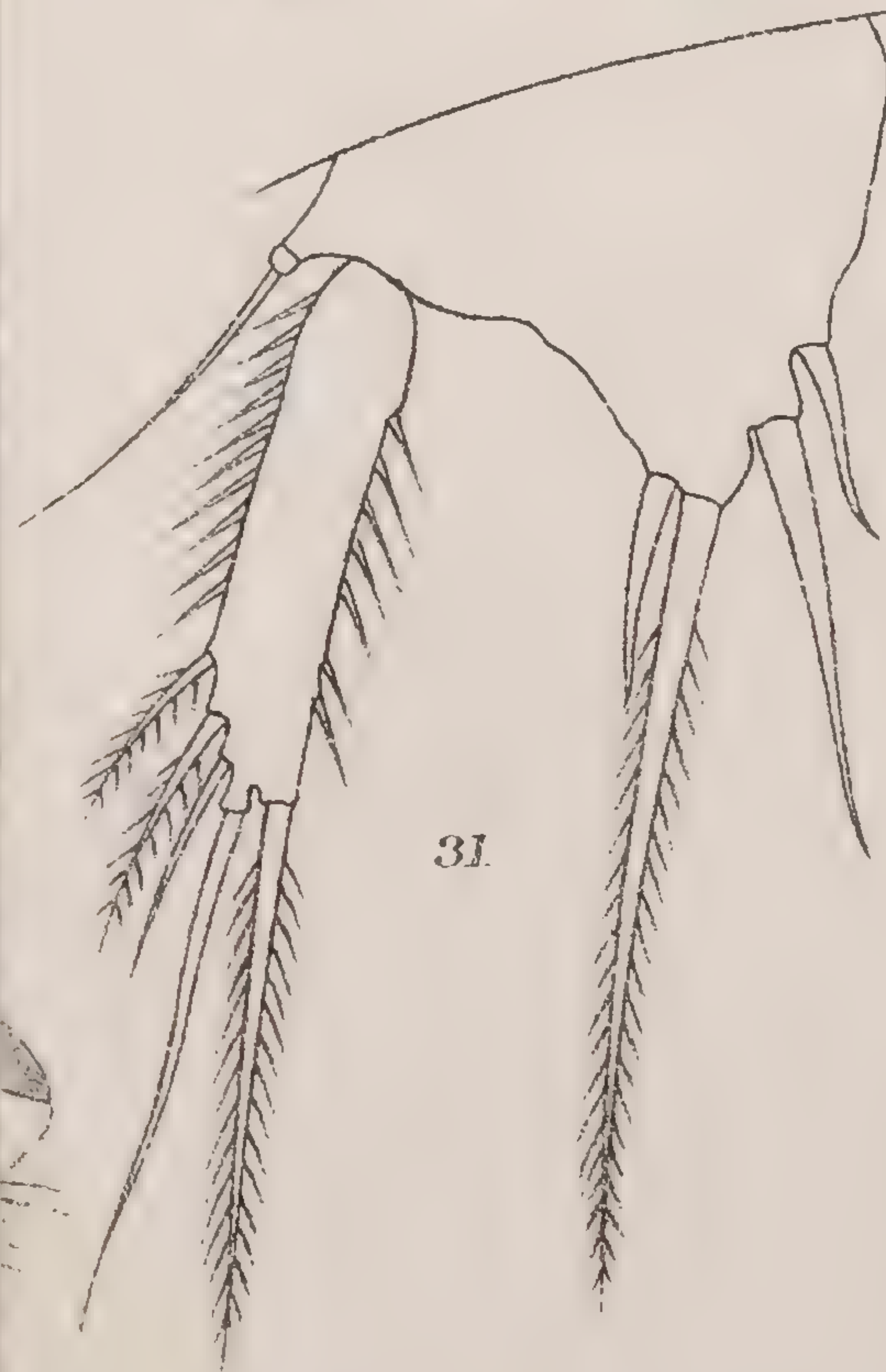
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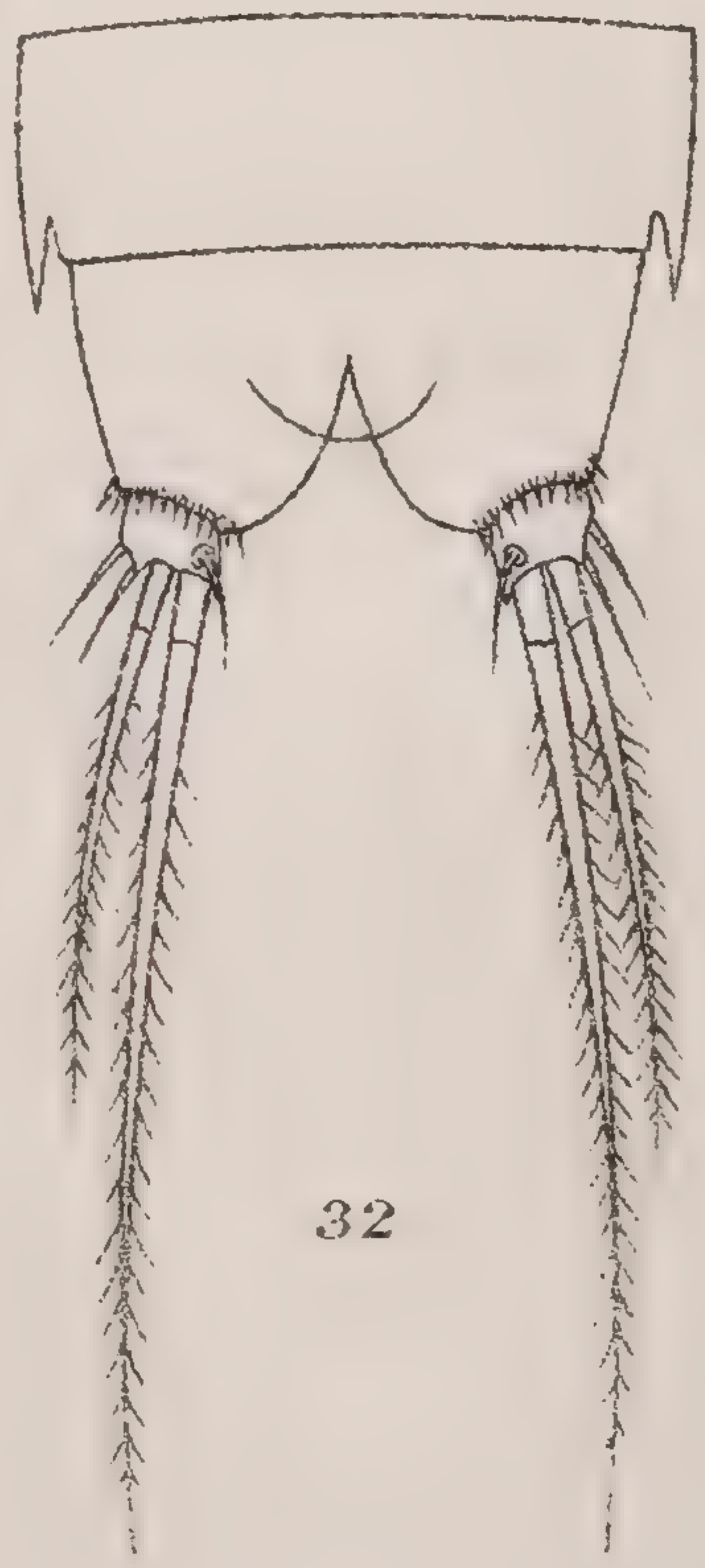
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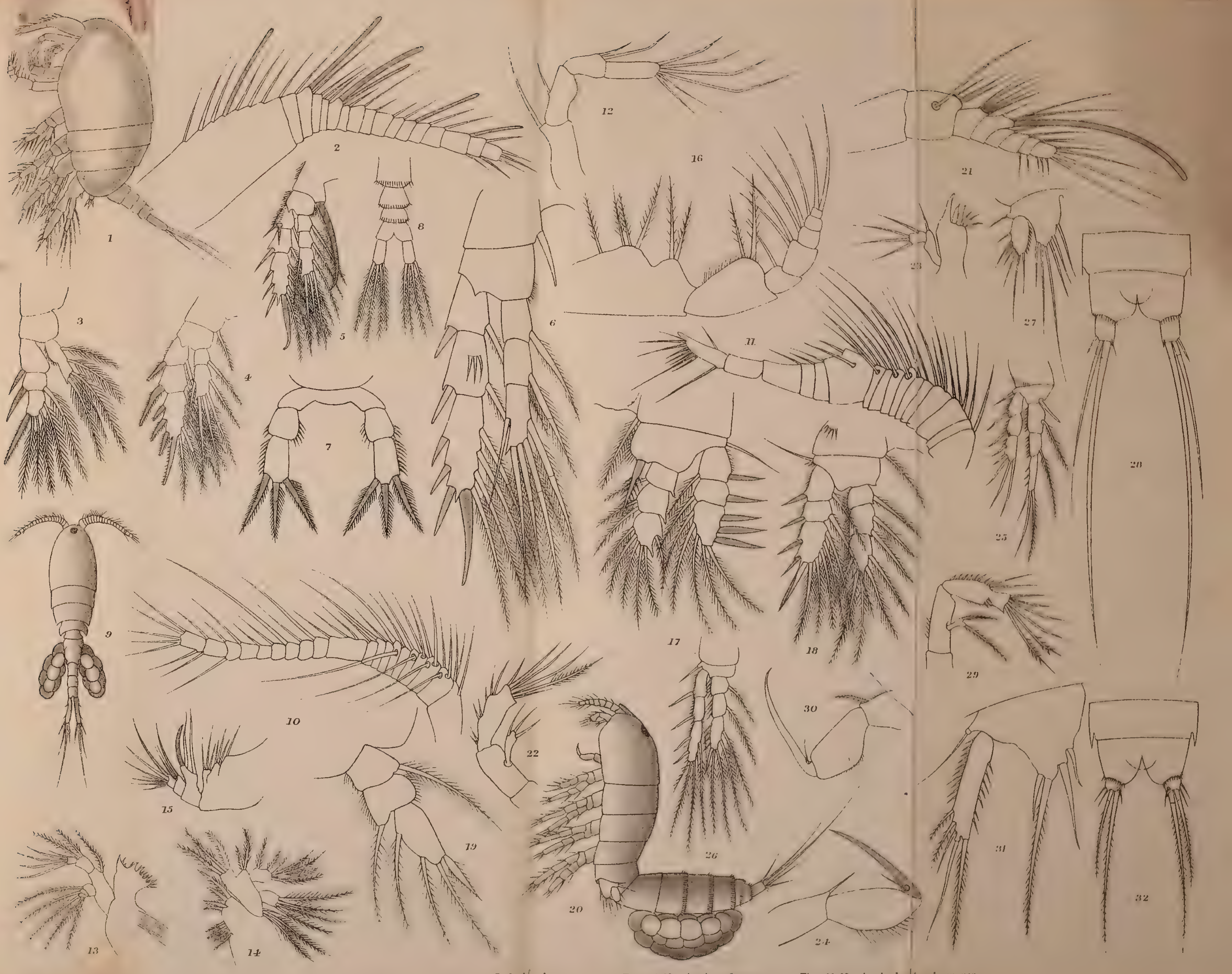
Andrew Scott, del. ad nat. giremis, *sp. nov.*



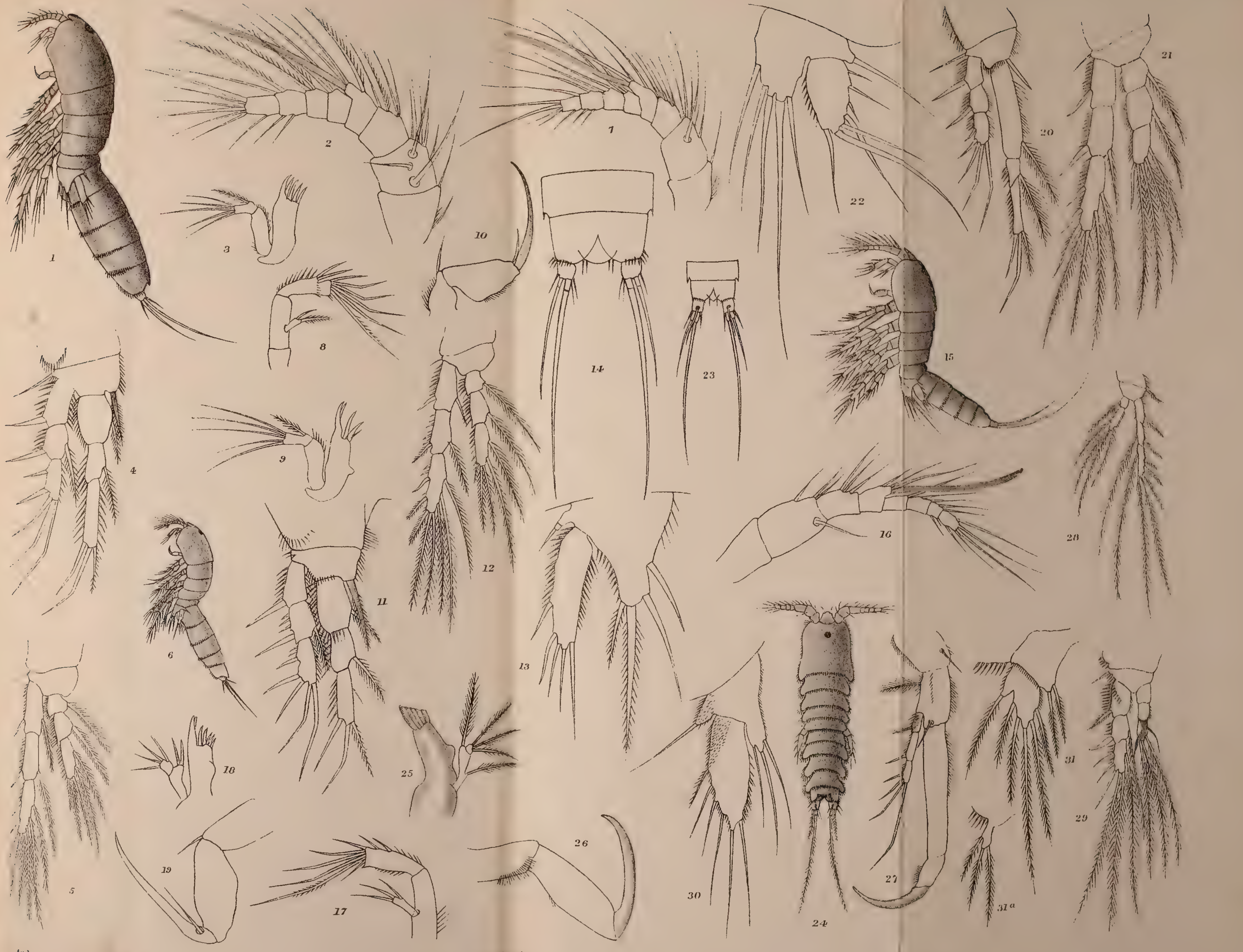
Andrew Scott, del. ad nat.

Figs. 1–8.—Pseudocyclopia caudata, *sp. nov.* Figs. 9–19.—Cyclopina elegans, *sp. nov.* Figs. 20–28.—Ameira reflexa, *sp. nov.* Figs. 29–32.—Ameira longiremis, *sp. nov.*

PLATE VI.

Andrew Scott, del. ad nat. te depressa, *sp. nov.*

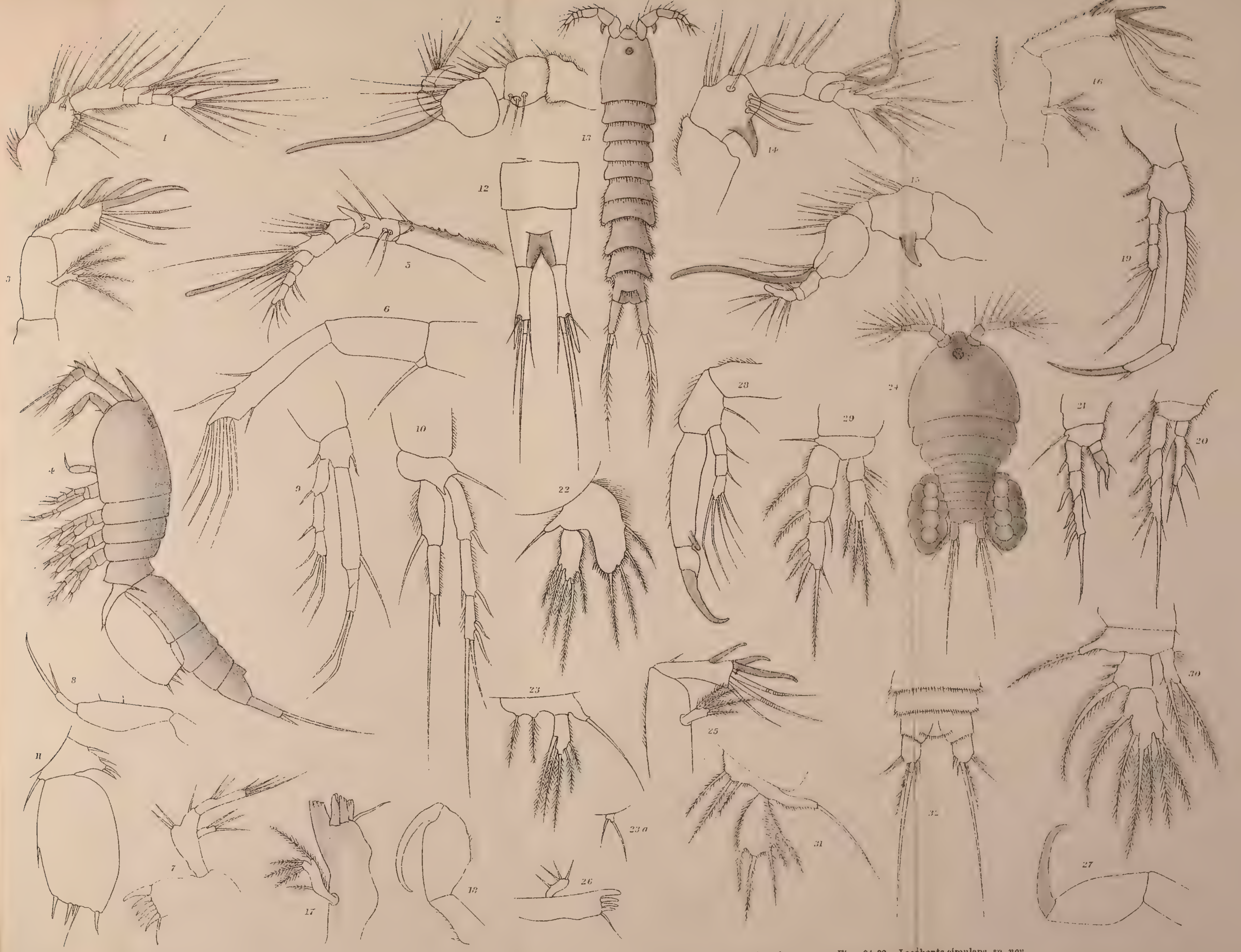
PLATE VI.



Andrew Scott, del. ad nat.

Figs. 1–5.—Ameira longiremis, *sp. nov.* Figs. 6–14.—Ameira longiremis, *var. intermedia.* Figs. 15–23.—Ameira exigua, *sp. nov.* Figs. 24–31.—Laophonte depressa, *sp. nov.*

Andrew Scott, del. ad phonte simulans, *sp. nov.*

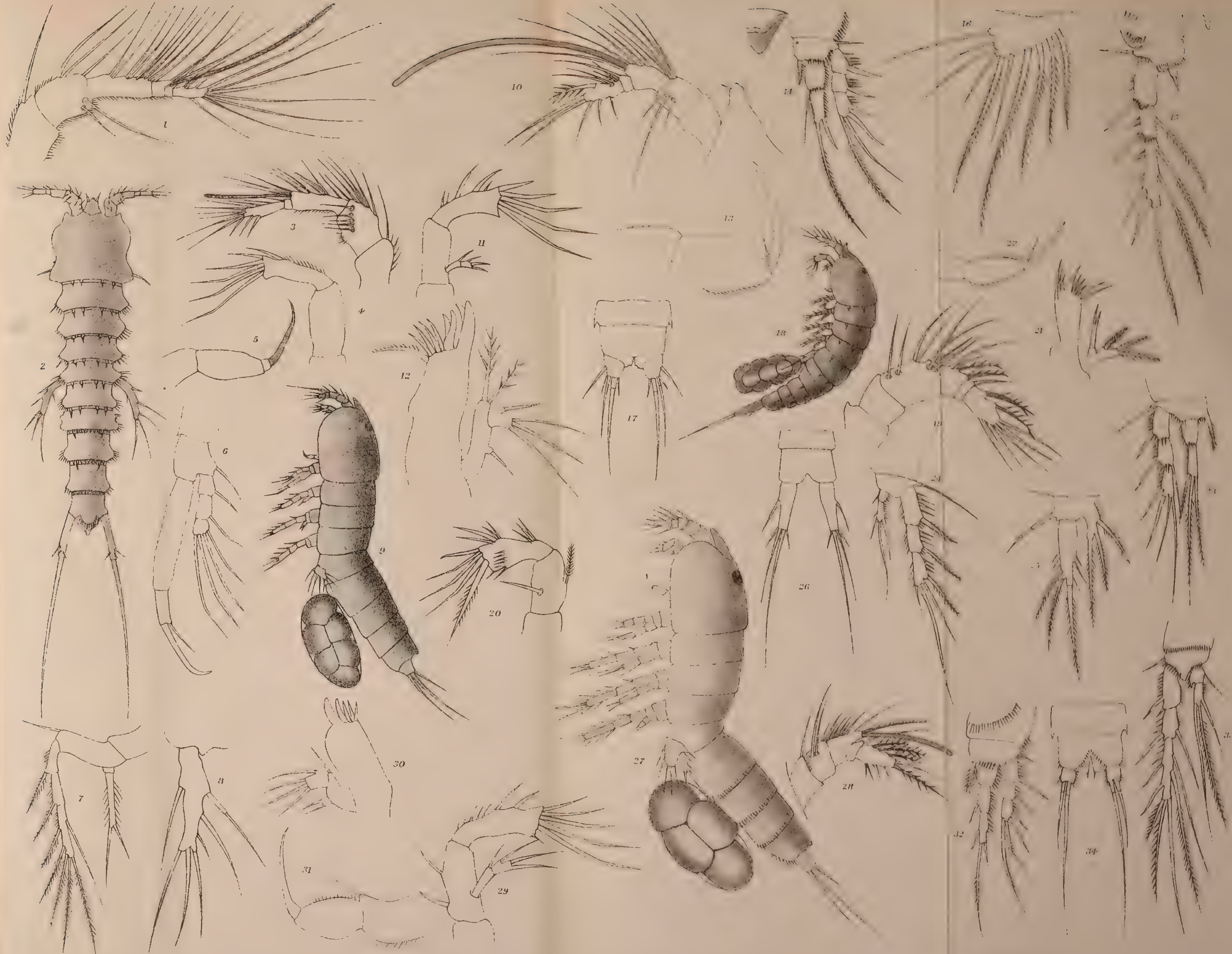


Andrew Scott, del. ad nat.

Figs. 1–3.—Laophonte depressa, *sp. nov.* Figs. 4–12.—Tetragoniceps consimilis, *sp. nov.* Figs. 13–23.—Laophonte denticornis, *sp. nov.* Figs. 24–32.—Laophonte simulans, *sp. nov.*

Andrew Scott, del. ad nat. clodes curvirostris, *sp. nov.*

PLATE VIII.



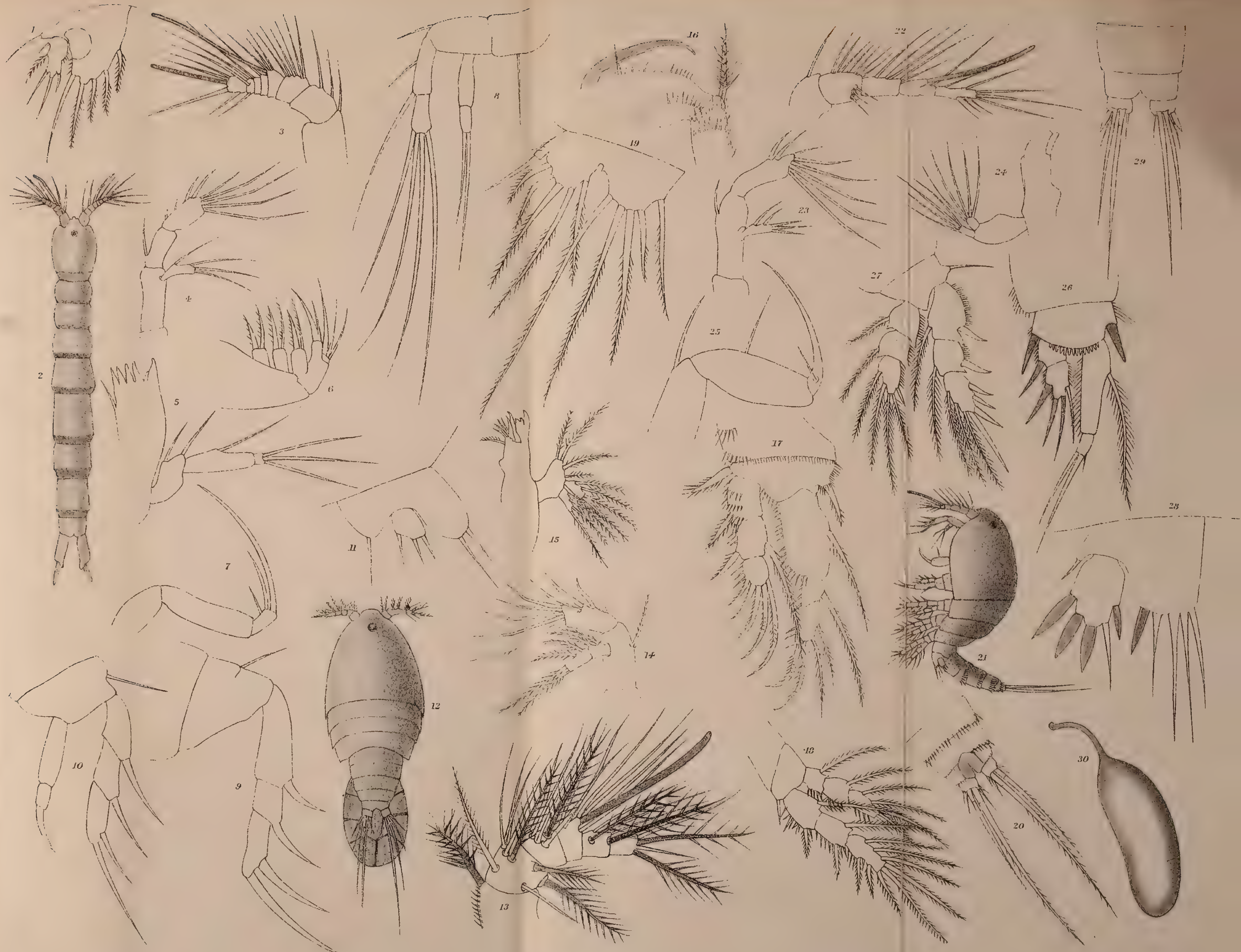
Andrew Scott, del. ad nat.

Fig. 1.—Laophonte simulans, *sp. nov.* Figs. 2–8.—Laophontodes typicus, *gen. et sp. nov.* Figs. 9–17.—Pontopolites typicus, *gen. et sp. nov.* Figs. 18–26.—Cletodes curvirostris, *sp. nov.*

Figs. 27–34.—Heteropsyllus curticaudatus, *gen. et sp. nov.*

Andrew Scott, del. ad nat^{s}*, sp. nov.*

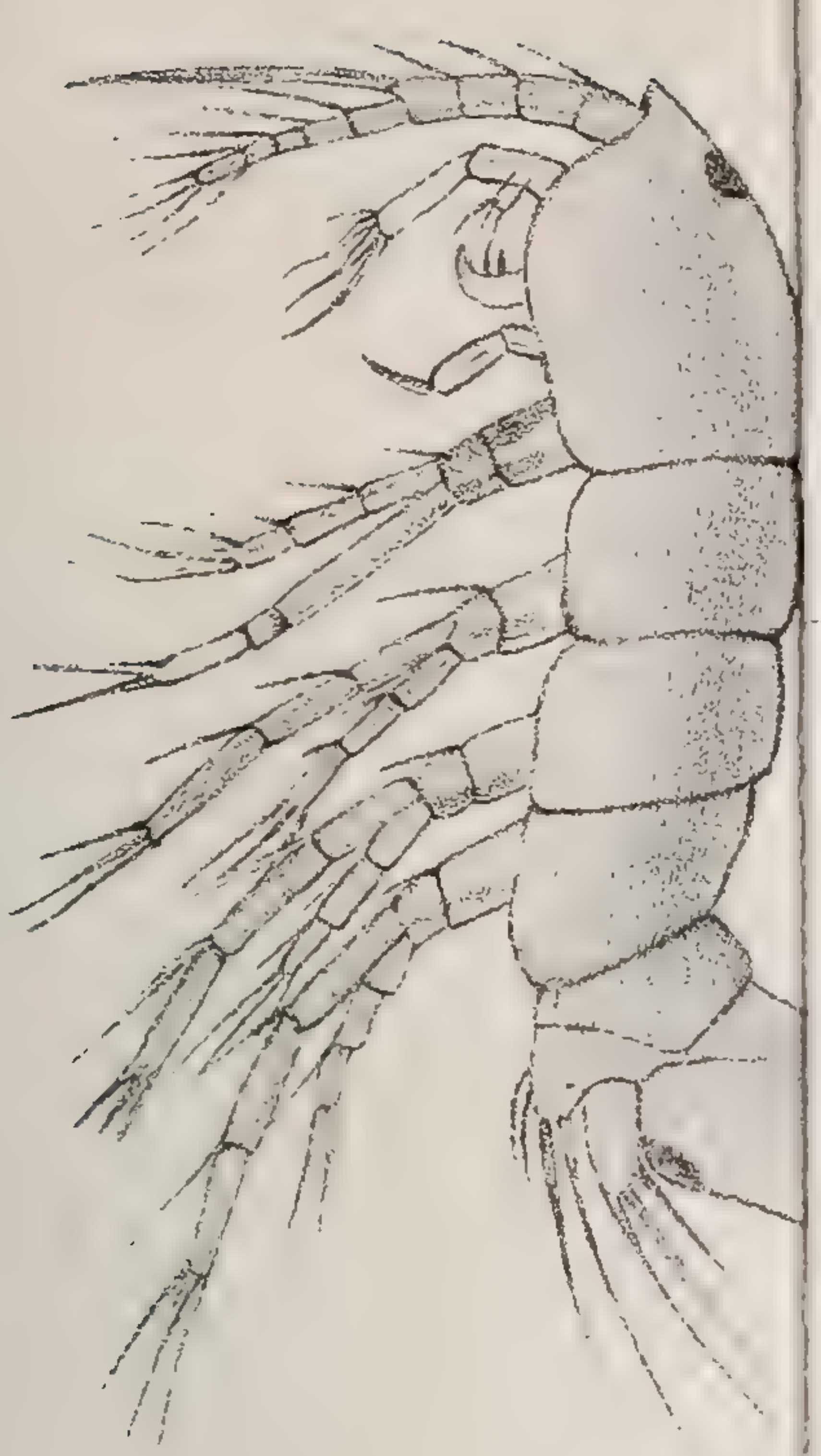
PLATE IX

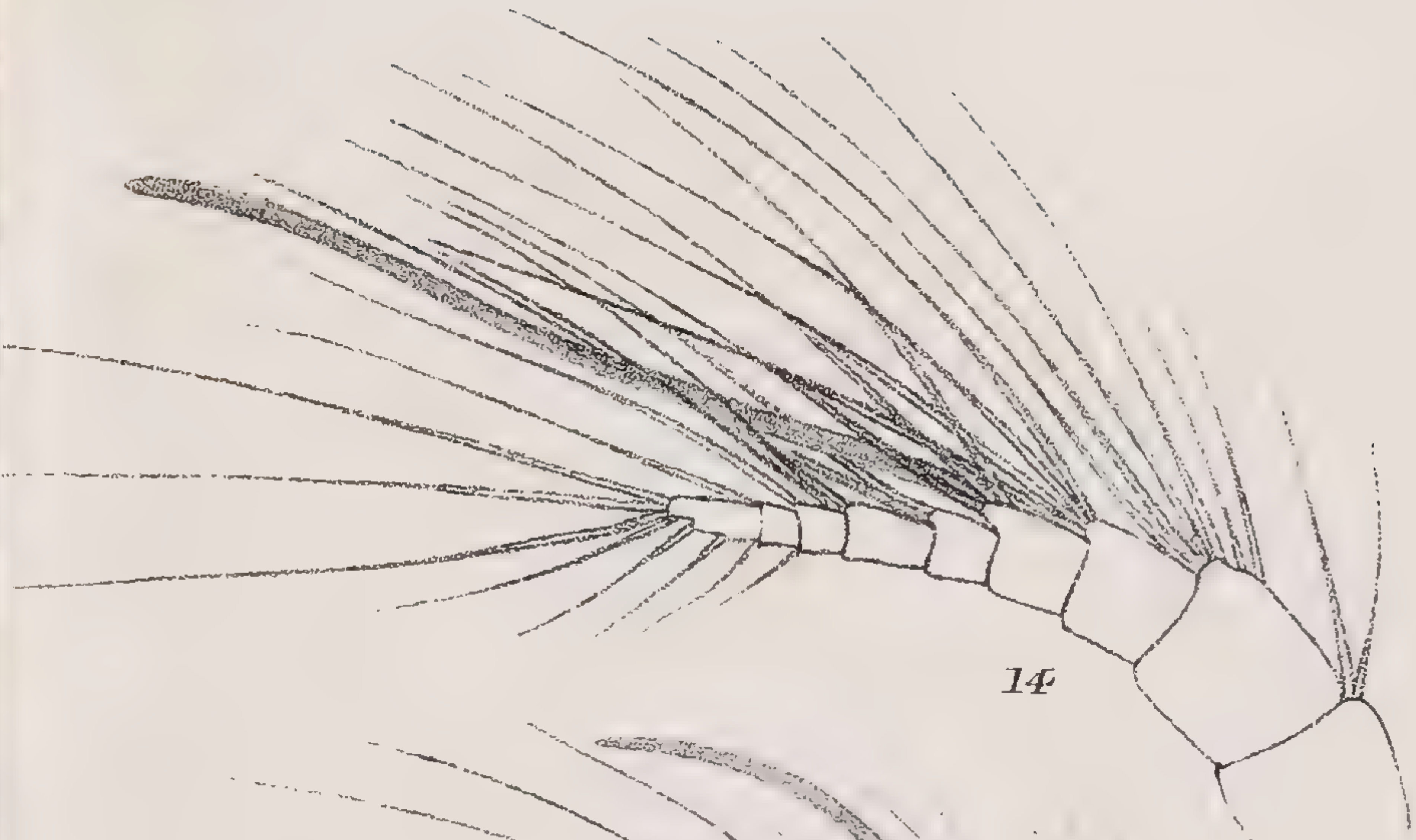


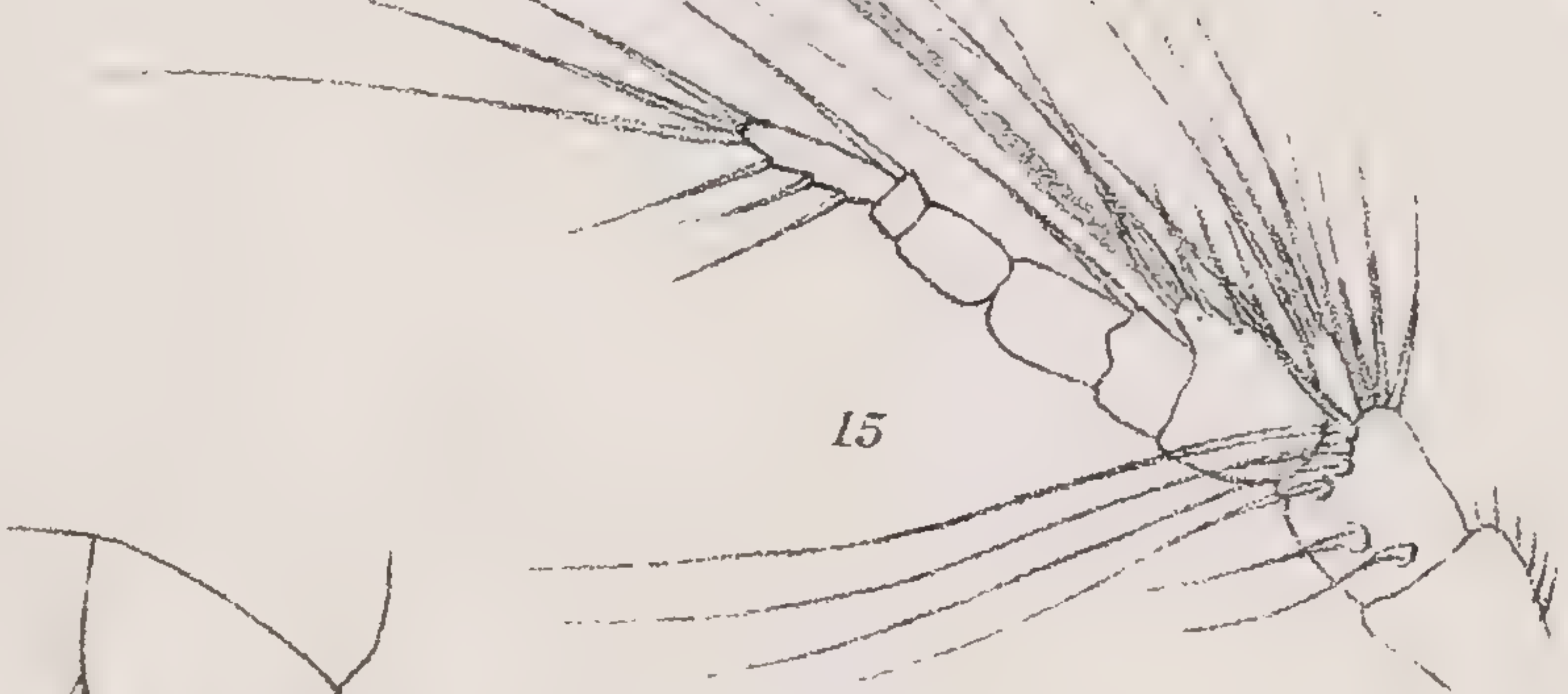
Andrew Scott, del. ad nat.

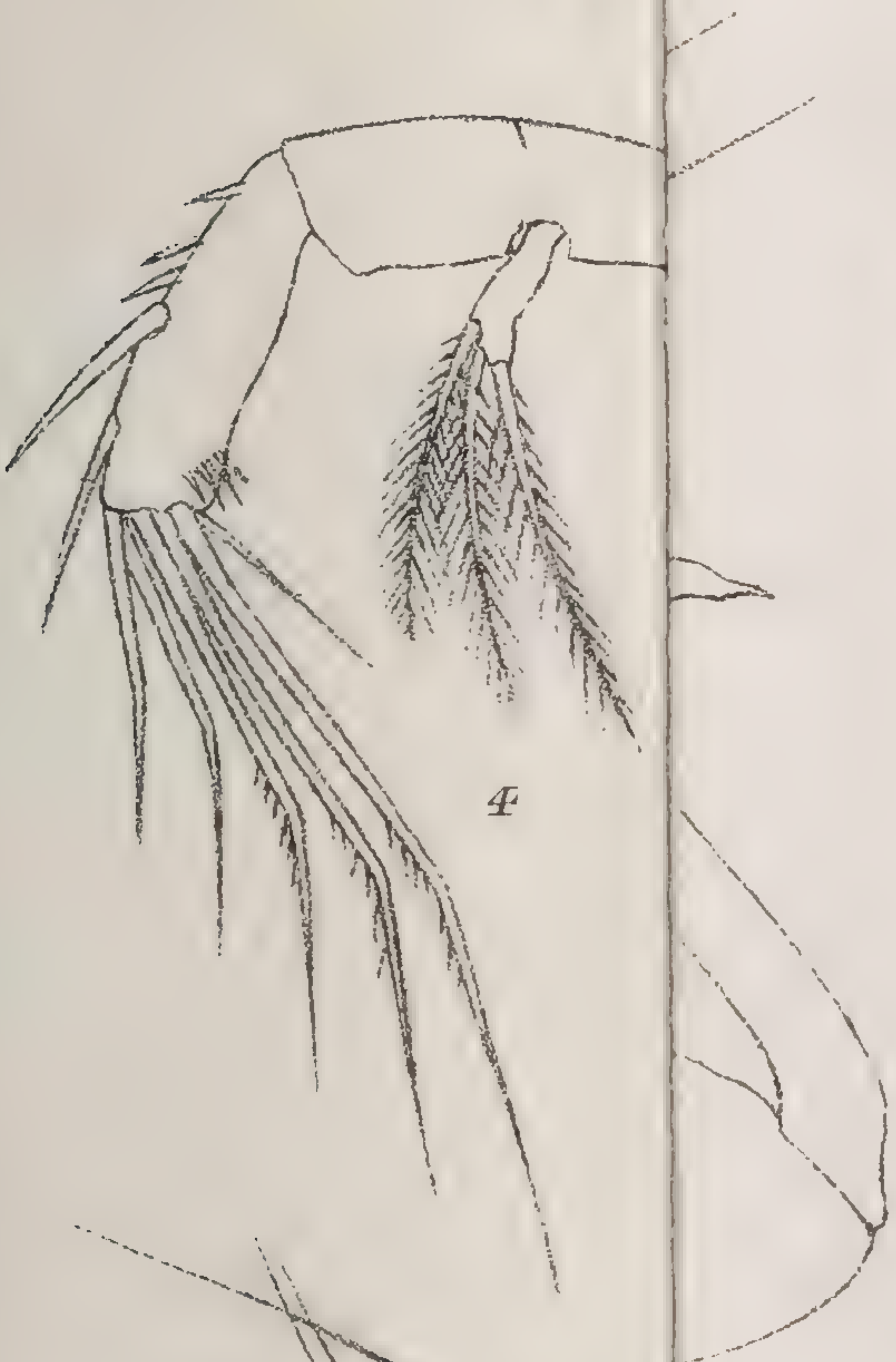
Fig. 1.—**Heteropsyllus curticaudatus**, *gen. et sp. nov.* Figs. 2–11.—**Leptopsyllus typicus**, *gen. et sp. nov.* Figs. 12–20.—**Dactylopus coronatus**, *sp. nov.*

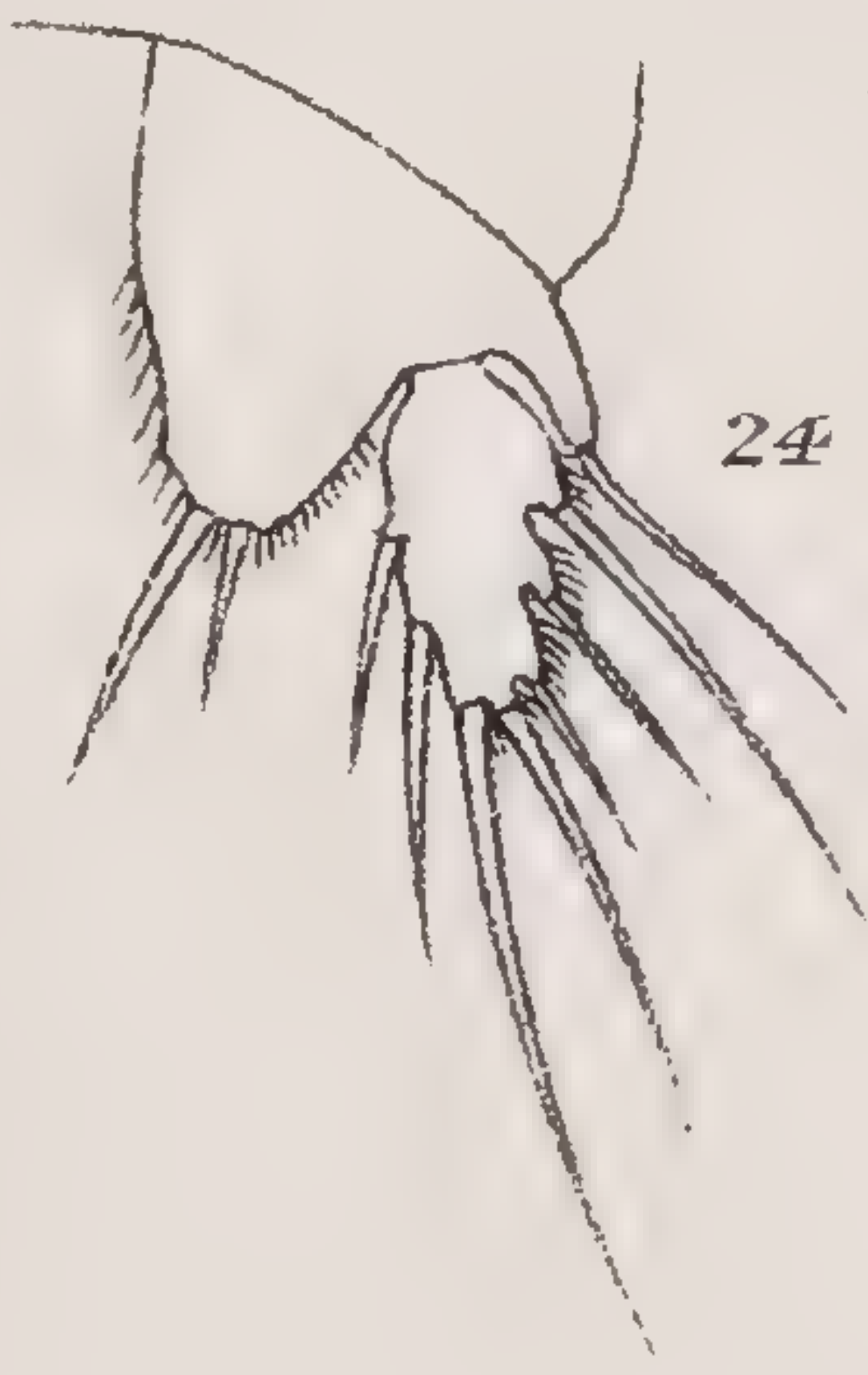
Figs. 21–29.—**Pseudowestwoodia andrewi**, *gen. et sp. nov.* Fig. 30.—**Ameira exilis** (*T. & A. Scott*).

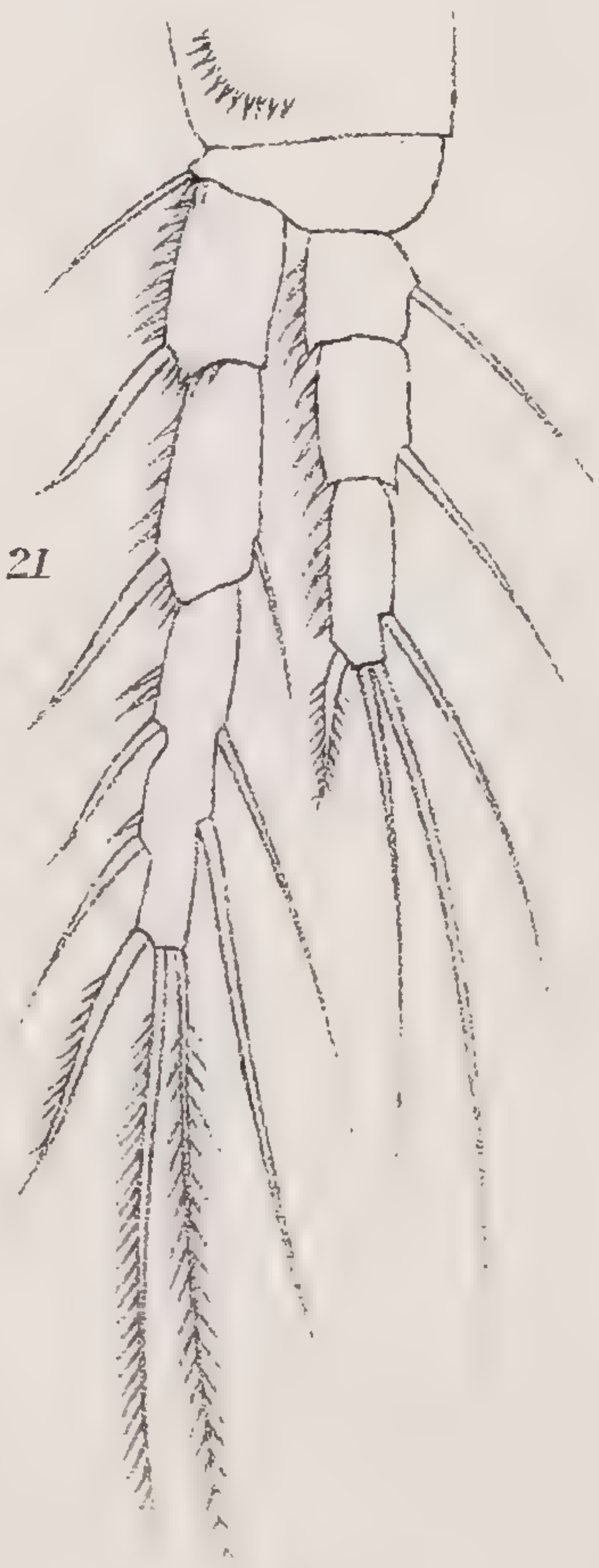


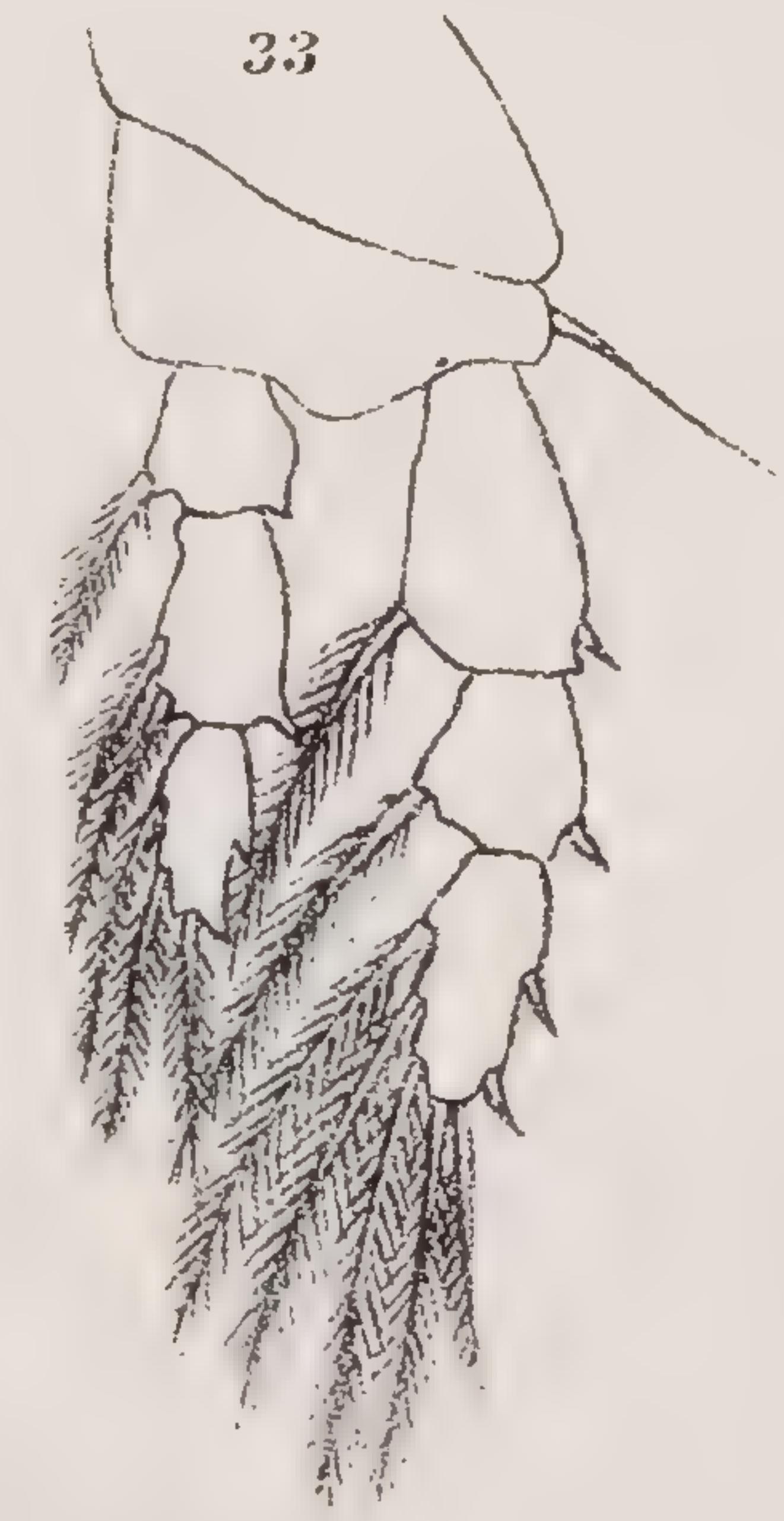


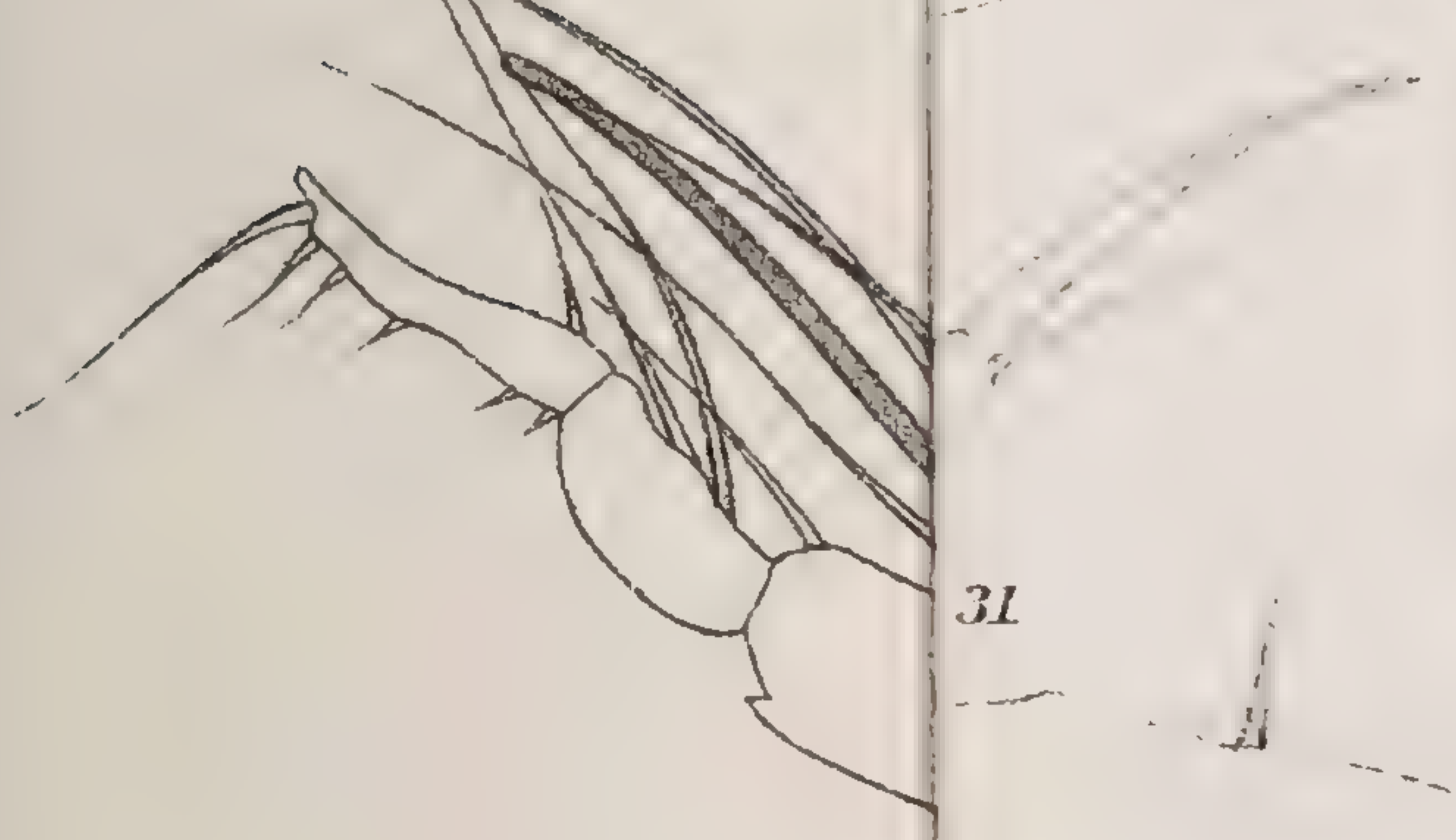


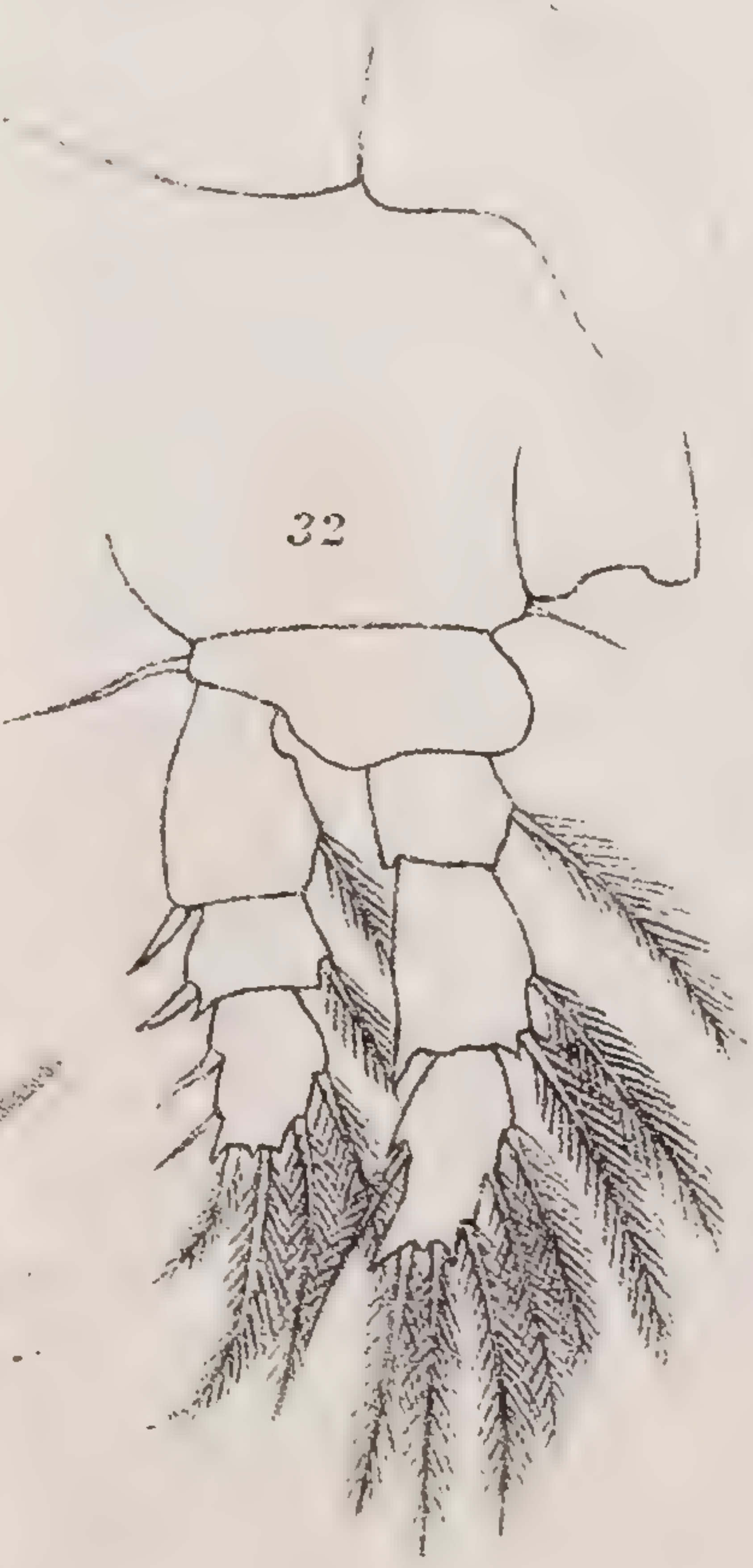


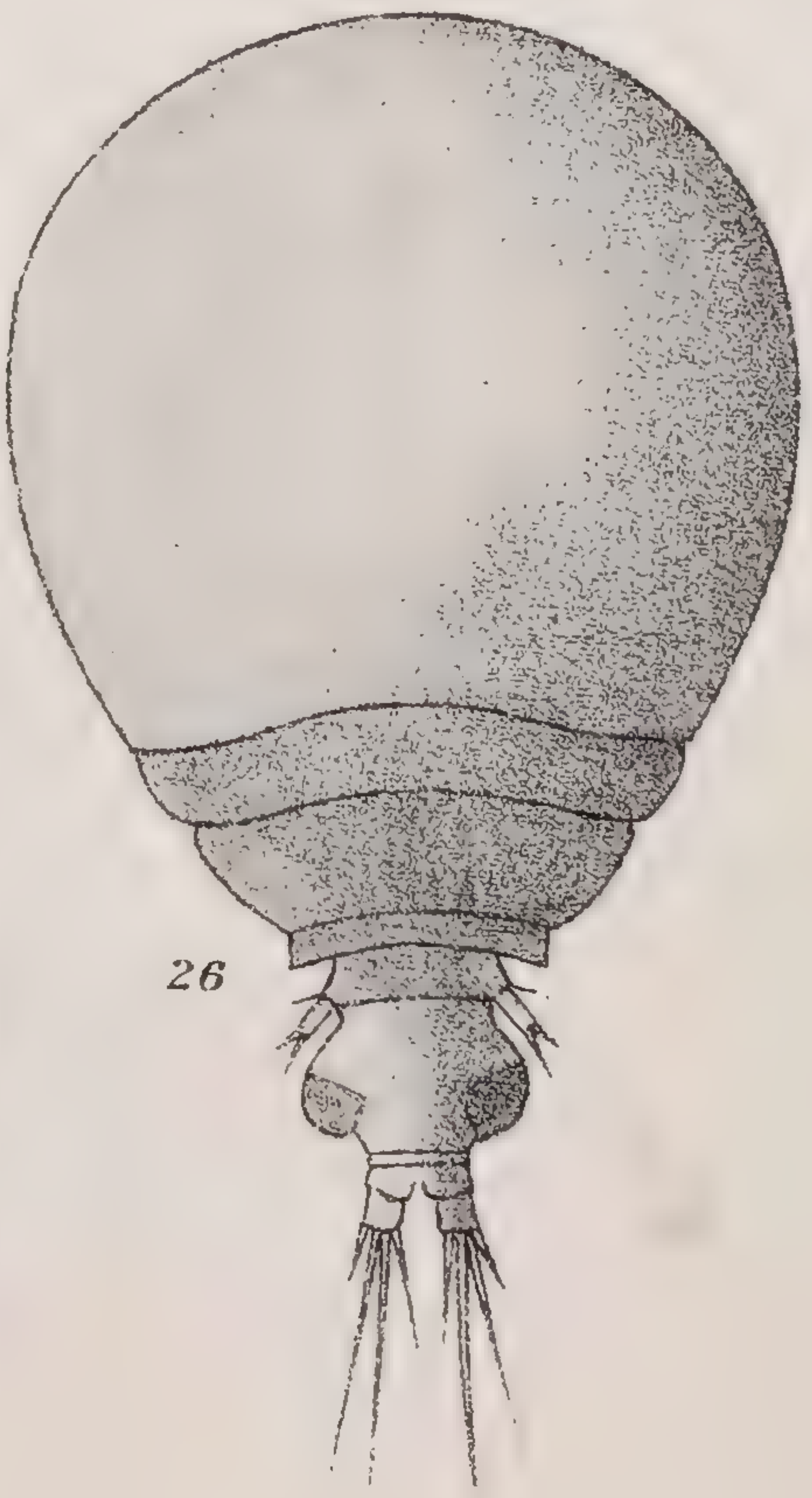






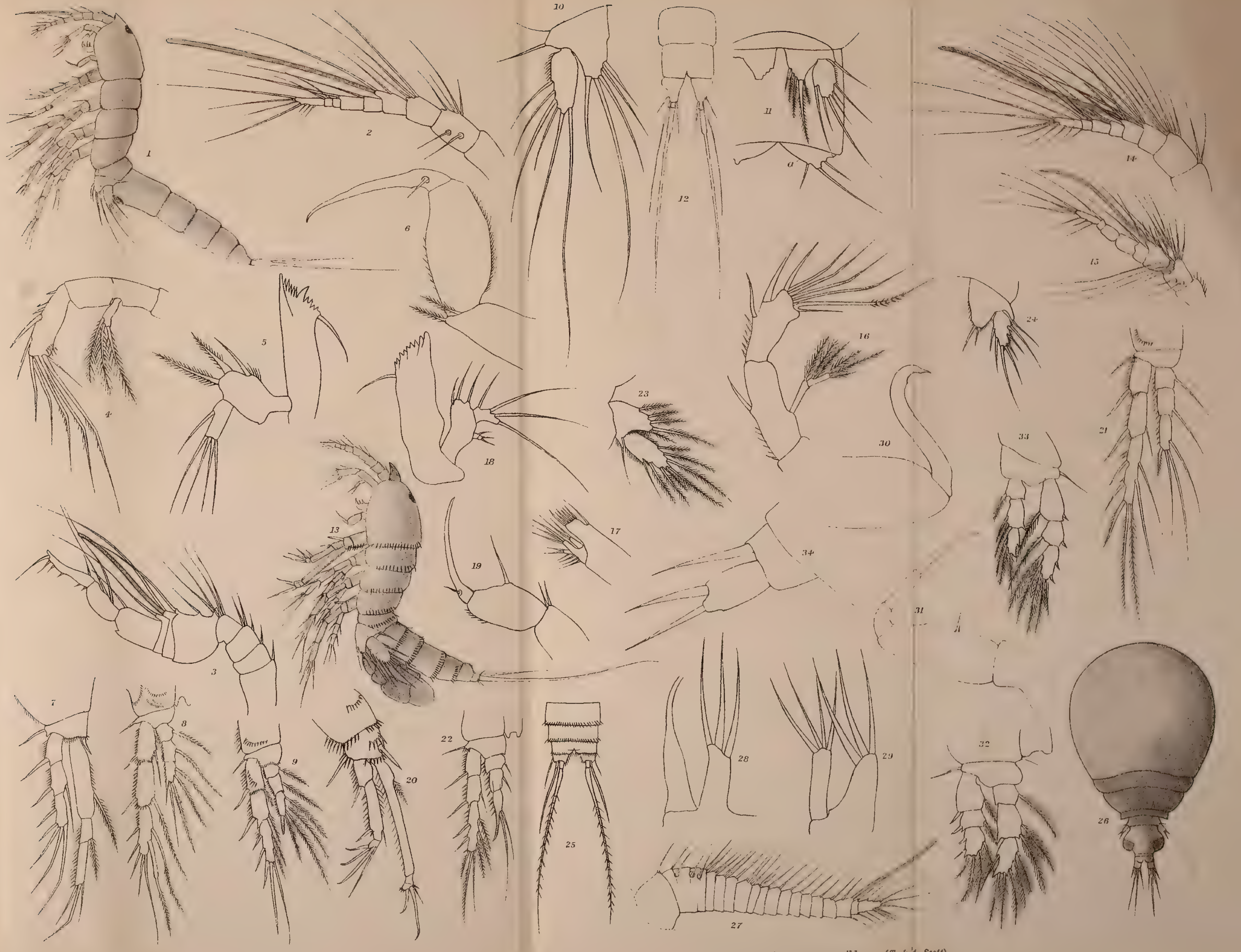






Andrew Scott, del. ad nat *A. Scott).*

PLATE X.



Andrew Scott, del. ad nat.

Figs. 1–12.—Ameira exilis (*T. & A. Scott*). Figs. 13–25.—Thalestris forficuloides (*T. & A. Scott*). Figs. 26–34.—Dermatomyzon gibberum (*T. & A. Scott*).

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